The

NOV 27 1951
DETROIT

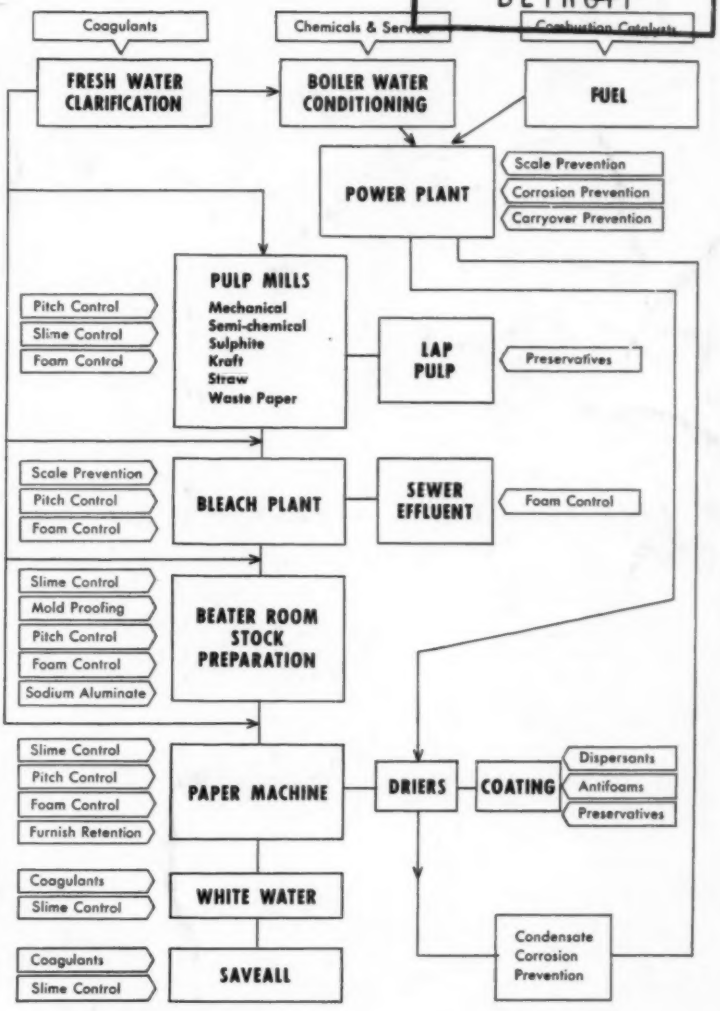
TECHNOLOGY DEPT.

CHECK CHART of Nalco®

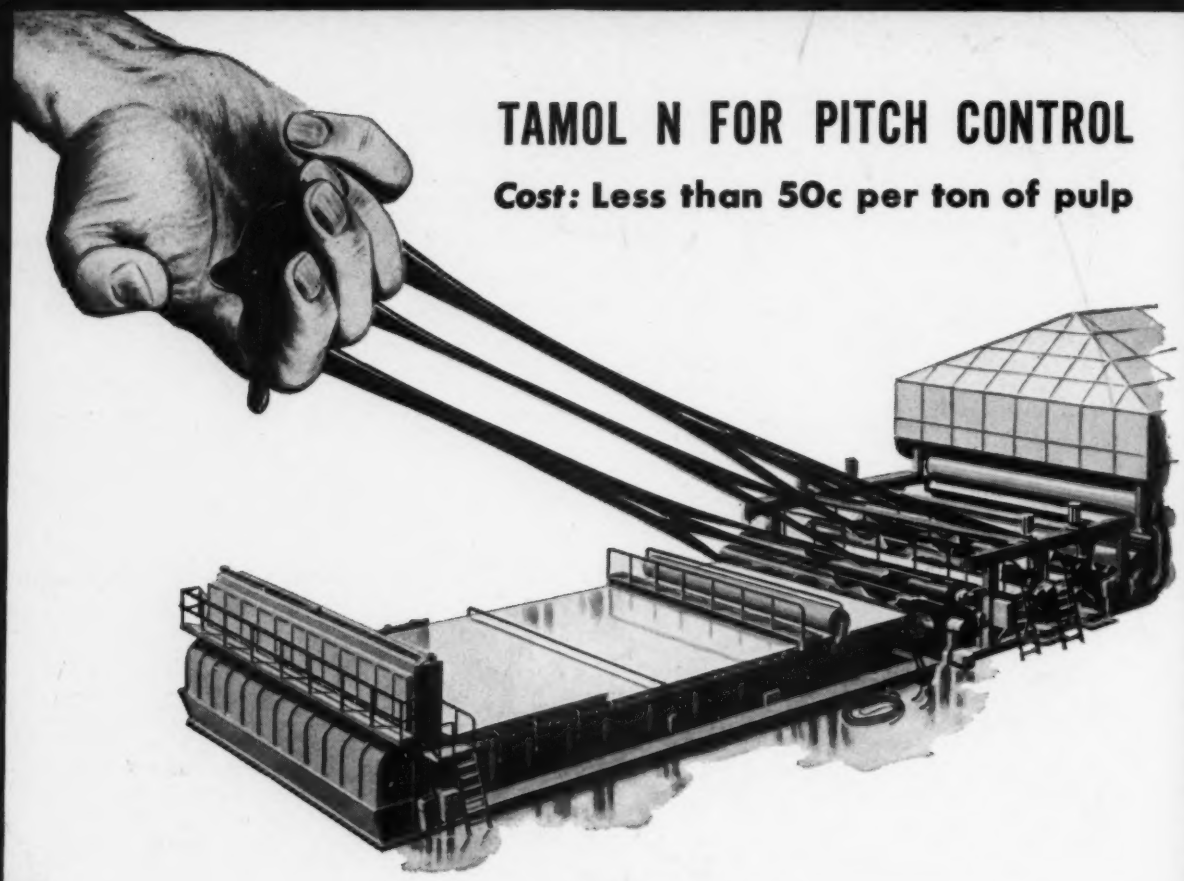
PRODUCTS and SERVICES for the PAPER INDUSTRY

FROM raw water through final recovery, Nalco chemicals and services help produce better pulp and paper products...speed processing...save time and money. Details on the chemicals and services outlined here are contained in Nalco Bulletin 55. Write for your copy today—or ask your Nalco Representative for answers to your problems.

NATIONAL ALUMINATE CORPORATION
6232 West 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario



THE Nalco SYSTEM • Serving the Paper Industry through Practical Applied Science



TAMOL N FOR PITCH CONTROL

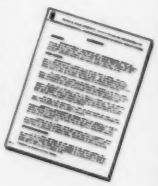
Cost: Less than 50c per ton of pulp

Here's the easy, low-cost way to control pitch, prevent expensive rejects, and eliminate costly shutdowns for cleaning.

Added directly to pulp in the beater, TAMOL N keeps your pitch dispersed in finely divided form. Pitch particles can't clump together to cause spots or holes in paper or to gum the paper machine. And this means fewer rejections and fewer production holdups.

Cost of TAMOL N pitch dispersant is extremely low—usually less than 50c per ton of pulp. Low salt content means added economy—you get what you pay for. If you use alum or clay additions for pitch control, TAMOL will improve their efficiency, too.

Papermakers have known and used TAMOL N for almost 20 years. We'll be glad to send you full details of this time-tested material.



OTHER CHEMICALS FOR THE PAPER INDUSTRY

RHOZYME BB and E-5 Enzymes—for efficient conversion of starch.

UFORMITE Wet-strength Resins—for all furnishes.

TRITON Surface-active Agents—with a score of uses in paper manufacture—in caustic cooking of cotton fiber, as a dispersing agent for pigments and metallic soaps, emulsion-type coatings.

HYDROSULFITE Reducing Agents—for stripping color from rag stock or for bleaching pulp.

HYAMINE Deodorants and Bactericides—for paperboard and glue.

TAMOL, UFORMITE, RHOZYME, TRITON, HYAMINE are trade-marks, Reg. U. S. Pat. Off. and in principal foreign countries.

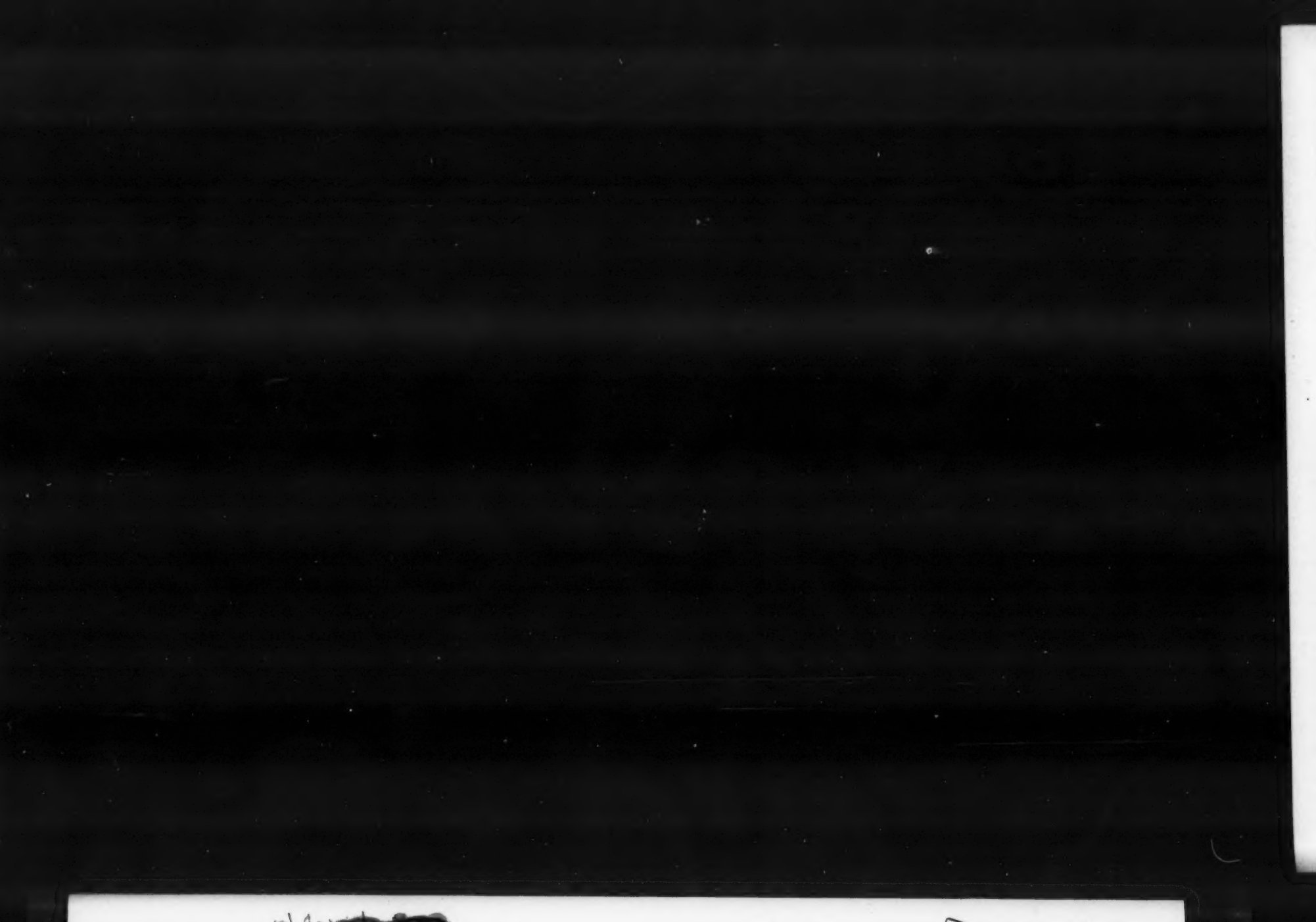
CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square, Philadelphia 5, Pa.

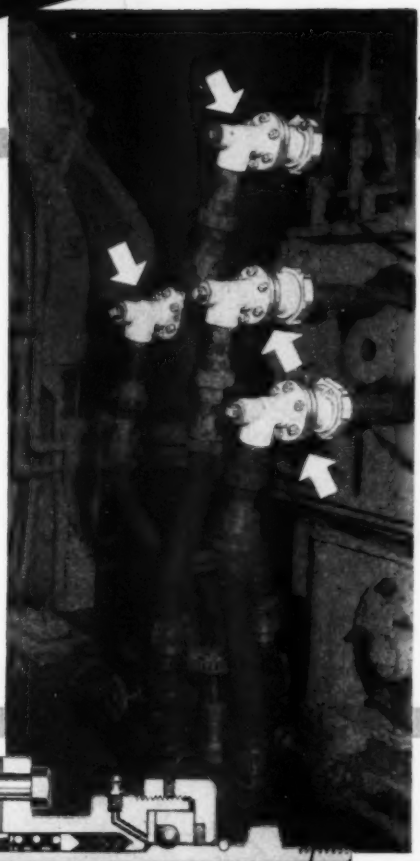
Representatives in principal foreign countries



"Your JOINTS really solved a Problem for us!"

Says MAINTENANCE ENGINEER in this Paper Converting Plant

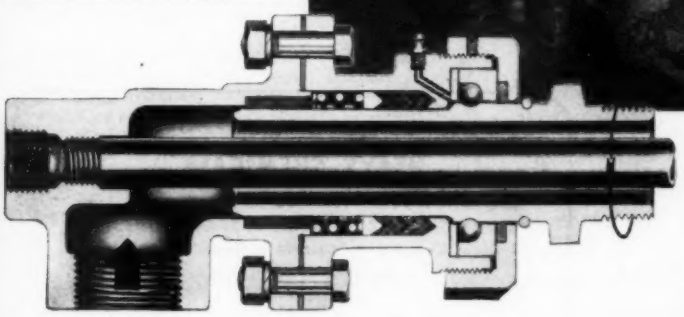
- Free-Floating, Low Torque Installations.
- Up to 50% Power Savings.
- Better Temperature Control.
- Low Maintenance, No Adjusting.
- All Parts Easily Accessible.



LOW TORQUE (freedom from friction drag) is the key to Barco's *"free-floating"* revolving joint installations. With this type of installation, Barco offers numerous advantages: power savings as high as 50%... very low maintenance requirements... quick, easy accessibility of parts... better temperature control... ability to withstand vibration and hard usage.

Take a look at Barco's new Type IBR Revolving Joint. Note the wide spacing between bearings which holds bearing loads and wear to a minimum. *Let us give you the complete story; ask for recommendations.* BARCO MANUFACTURING CO., 1826 M Winnemac Ave., Chicago 40, Ill. In Canada: The Holden Co., Ltd.

Left: Ability to stand up under high speed, continuous duty on large and small coating rolls has made these Barco Joints popular with the user.



For complete information on this new Type IBR Revolving Joint, send for Bulletin 300.

BARCO *Revolving* JOINTS

For Paper Machine Dryers, Calenders, Paper Converting Equipment

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

MATHIESON'S AT YOUR SERVICE... at LAKE CHARLES, La.

Mathieson service starts at the plant with top quality chemicals... produced in the ever-increasing quantities demanded by American industry... shipped when and where needed. From Lake Charles, Louisiana, for example –in the heart of the thriving Gulf Coast region–Mathieson delivers by ship, train and truck on reliable schedules, these heavy chemicals:

Soda Ash **Caustic Soda**
Ammonia **Nitric Acid**
Nitrate of Soda

Mathieson's at your service from 16 strategically situated plants. Supplementing this efficient distribution system is a network of jobber and distributor stocks for less-carload deliveries.

You may find it to your advantage to discuss with us now your future chemical requirements. Mathieson Chemical Corporation, Baltimore 3, Maryland.

MATHIESON
HEAVY CHEMICALS

Sulphuric Acid • Processed Sulphur • Soda Ash
Caustic Soda • Bicarbonate of Soda • Ammonia
Sodium Chlorite • Nitrate of Soda • Chlorine
Calcium Hypochlorite

Mathieson
CHEMICALS

9297

SERVING INDUSTRY, AGRICULTURE AND PUBLIC HEALTH

The Paper Industry

Technology • Engineering • Management • Production

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THE PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index**. An index to each volume is issued annually by the publisher as a part of the April number.

Copyright 1951 by Fritz Publications, Inc.

Published monthly by:

FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

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Advertising Representatives:

CHICAGO 5: **John D. Henderson,**
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9 Rockefeller Plaza, Circle 7-3085.

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BOSTON 16: **Meade & Company,**
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LOS ANGELES 14: **Murray Bothwell,**
412 West Sixth Street, Vandike 5875.

PORTLAND: **Murray Bothwell,** 412 West Sixth Street,
Los Angeles 14, Calif., Vandike 5875.

SEATTLE 4: **Arthur G. Neitz,**
914 Second Avenue, Eliot 1769.

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

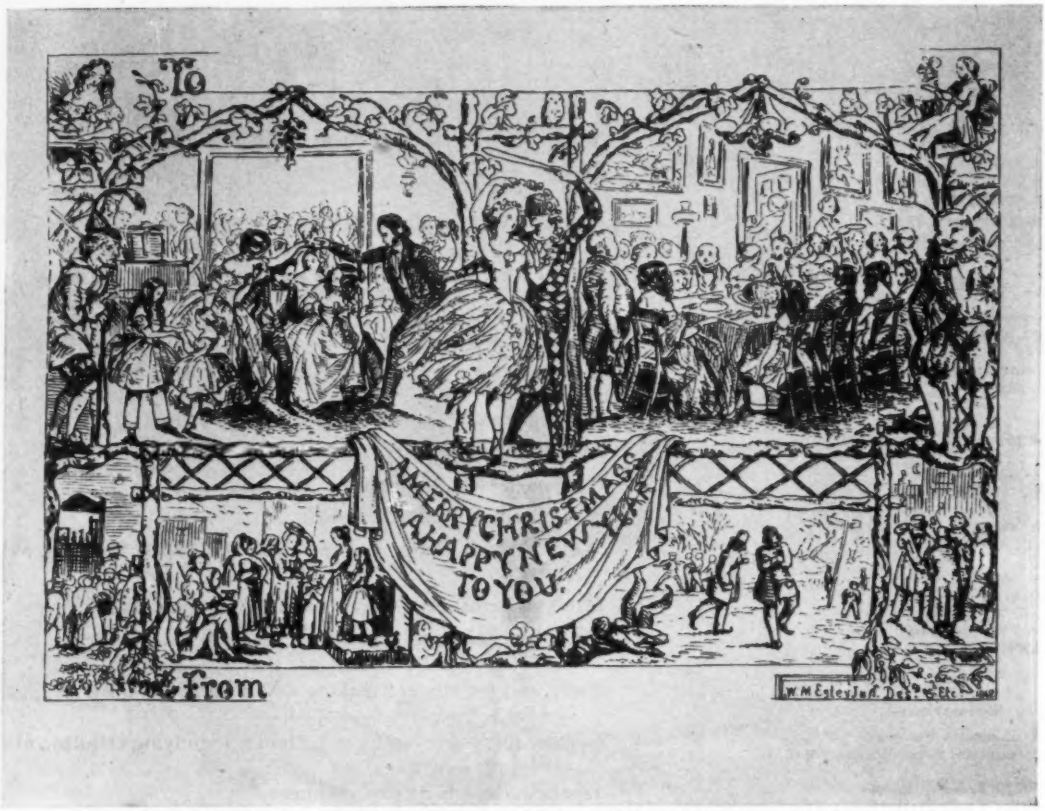
Published at 404 North Wesley Avenue, Mount Morris, Illinois.

Address all correspondence intended for publication to Editorial and Executive Office, 431 South Dearborn Street, Chicago 5, Illinois.

Member: Audit Bureau of Circulations, The Associated Business Publications.

Entered as second class matter December 13, 1948, at the post office at Mount Morris, Illinois, under the Act of March 3, 1879.

Subscription rates: United States, U. S. Possessions, and Canada, $3.00 for one year, $5.00 for two years, $6.00 for three years. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.



Facsimile of the first-known Christmas Greeting Card. Original now on display in the British Museum in London.

The First Christmas Card

When, in 1842, William Maw Egley, a young London engraver's apprentice, produced the first-known Christmas card, he started what was destined to become both a popular custom and a major industry. While the Christmas card originated in England, the sending and receiving of greeting cards has attained its greatest popularity in America. Today more than two hundred greeting card publishers produce more than three billion cards annually. It is estimated that nearly one hundred million dollars is now spent each year to mail greeting cards of all types and for all occasions—a sum representing approximately ten percent of the Government's first-class mail revenue.

In reaching such a vast volume, greeting cards have become one of the largest users of paper, and thus have made an important contribution to the swift, continuous growth of America's pulp and paper industry.

The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

F. C. HUYCK & SONS · *Kenwood Mills* · RENSSELAER, N. Y.

KENWOOD WOOL PRODUCTS
HUYCK *Felts*

"Best little woods tractor in the business!"

COMING through forest of slash pine near Woodbine, Georgia, is L. B. Proctor's International TD-6. Proctor says, "My TD-6 logs out 40 to 60 trees per hour. Internationals are just right for our operations, and I like mine so well that I've ordered another one."

GOING to the truck pile is an International TD-6 belonging to C. L. McCarthy, Jr., White Oak, Georgia. "Our TD-6 has given us faultless service for many years at very low cost," says McCarthy. "It's the best little woods tractor in the business!"

COMING OR GOING, International power pays off for pulpwood

When it comes to working in the piney, you just can't beat an International tractor. Whatever model you get—diesel or gasoline, crawler or wheel—it will pay off in hard work and low-cost operation, get your quota out with more profit to you. And your International Industrial Distributor will back it up with expert service through the busy years ahead. Put International *"Power that Pays"* to work for you right away!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

POWER THAT PAYS

INTERNATIONAL HARVESTER

INTERNATIONAL

Impco POINTS TO

Now you can keep your black liquor evaporators FREE from this fibrous deposit!

Photographs of actual encrustation of evaporator tubes formed before Waco Filter was installed.

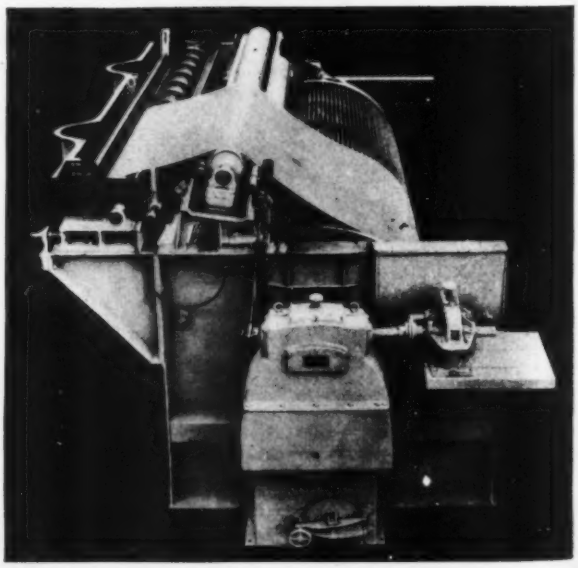
Up to 95% "fines" recovered before evaporation!

The Waco Filter forms its own continuous filter paper through which liquid is filtered for removal of solids. Contaminated filter paper is simultaneously removed.

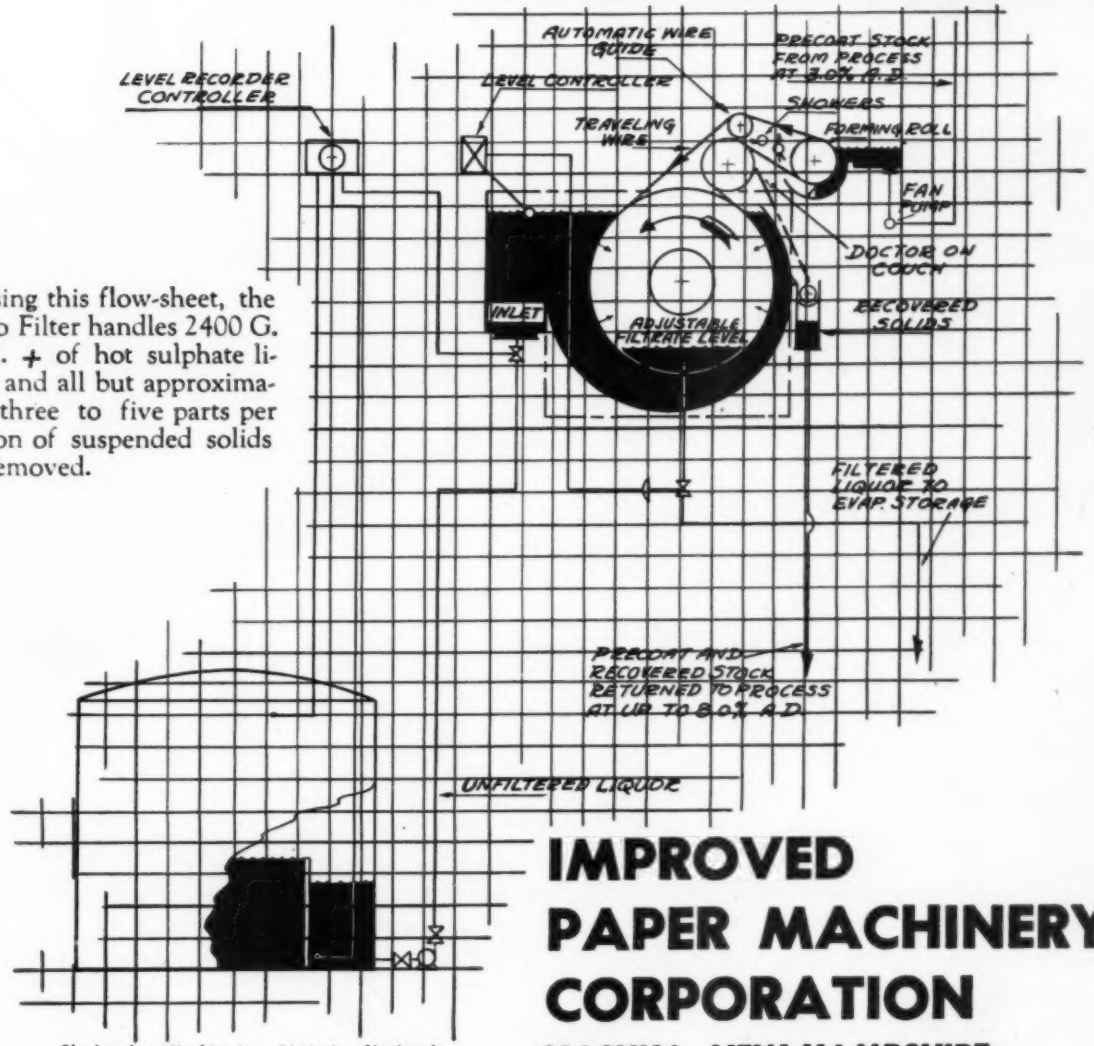
Stock consumption is negligible.

Filtering black liquor is just one job it does well.

Consult us about filtering fresh-water, white water, mill effluents—all mechanical filtration jobs.



ANOTHER WACO FILTER APPLICATION

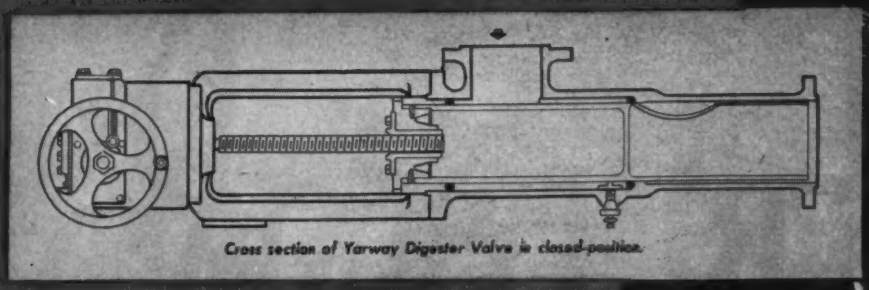


Using this flow-sheet, the Waco Filter handles 2400 G. P. M. + of hot sulphate liquor and all but approximately three to five parts per million of suspended solids are removed.

Sherbrooke Machineries Limited, Sherbrooke, Quebec, manufacture similar equipment in Canada.

IMPROVED PAPER MACHINERY CORPORATION

NASHUA, NEW HAMPSHIRE



Cross section of Yarway Digester Valve in closed position.

COOSA RIVER *Uses*

YARWAY SEATLESS DIGESTER BLOW VALVES FOR...

- TIGHT SHUT-OFF
- FREE DISCHARGE
- LOW MAINTENANCE
- FAST OPERATION
- REMOTE CONTROL

● At the vast new plant of the [illegible] River Newsprint Co., in Alabama, six 8" Yarway Seatless Digester Blow Valves are controlling the discharge from pulp digesters.

Their unique seatless principle, with a balanced sliding plunger, permits tighter shut-off, free discharge with no "hung-up" solids, and low maintenance.

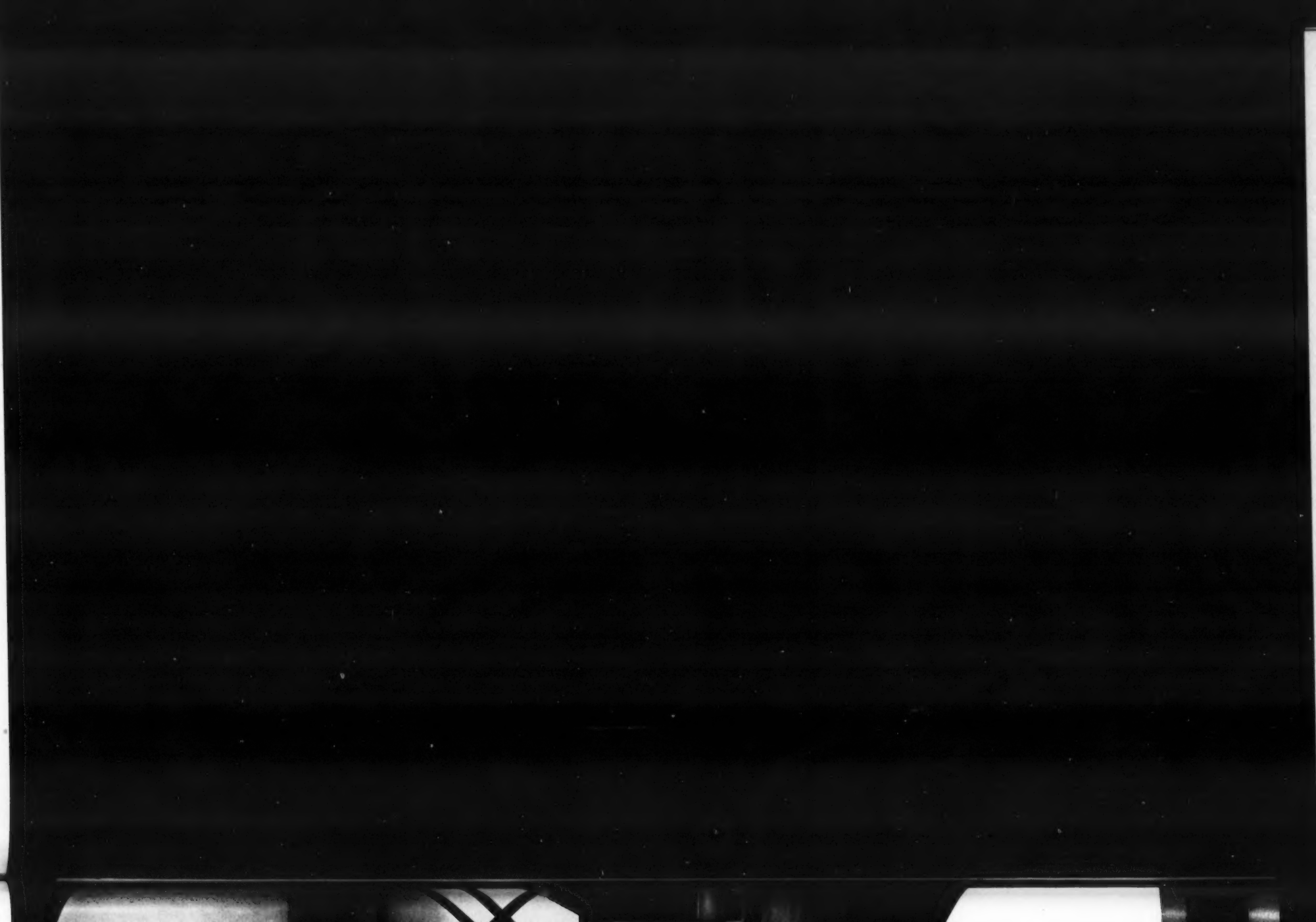
Motor control permits fast operation by push button at any remote spot, usually the charging floor.

Other mills report that by using Yarway Digester Seatless Blow Valves, they get more cooks per day, with less operating and maintenance attention, than with any other type valve for the service.

For full details and specifications call your nearest Yarway office or write for Yarway Bulletin B-440.

YARNALL-WARING COMPANY
149 Mermaid Avenue, Philadelphia 18, Penna.
BRANCH OFFICES IN PRINCIPAL CITIES

YARWAY DIGESTER VALVES



No ONE chain serves every purpose

LINK-BELT offers the right chain

. . . engineered for your requirements

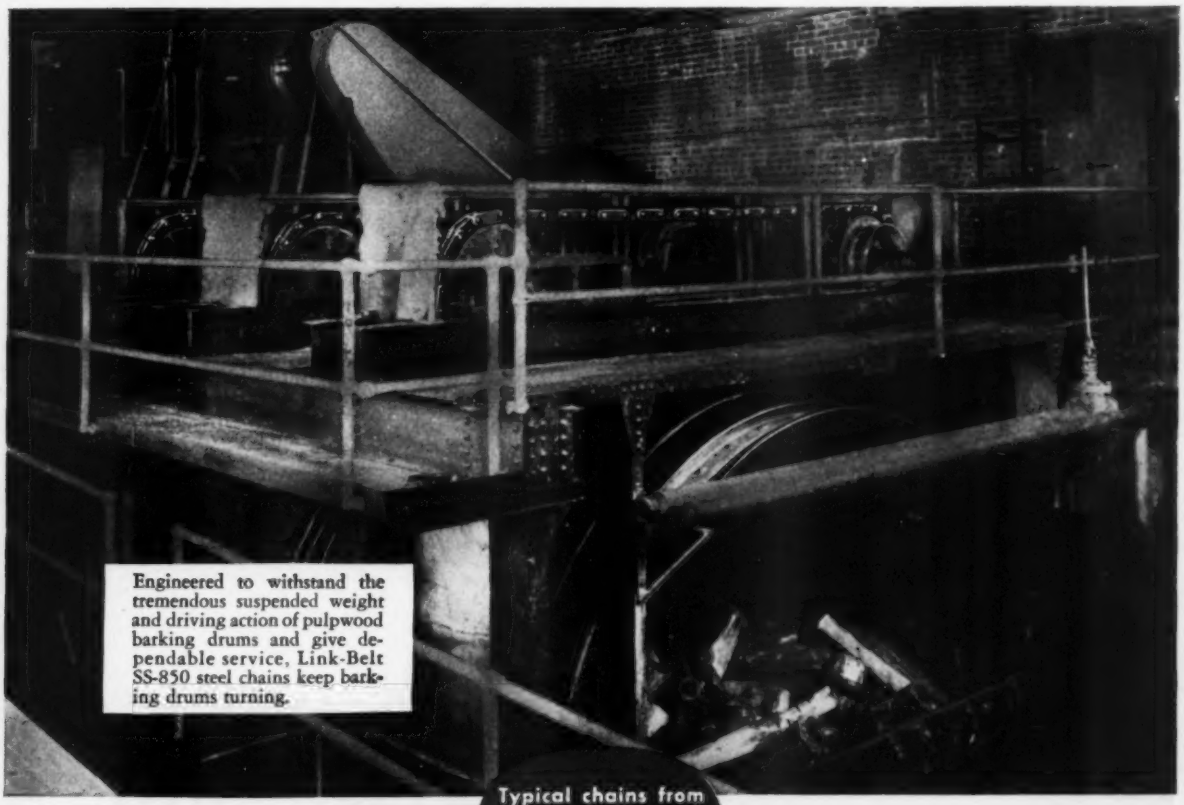
Don't settle for a "cure-all" chain to handle every job. Different types of chain have different characteristics. That's why Link-Belt makes the most complete line of chains in the world. Our engineers can recommend the exact type of chain to fit your particular needs . . . the one that does your job best.

Equally important is your assurance that *any* chain with the Link-Belt name will give you longer chain life. Exact control of raw materials and processes . . . plus manufacturing refinements add up to the highest standards.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, factory branch stores and distributors in principal cities. 12,328-H

LINK-BELT

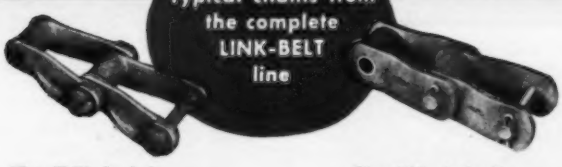
CHAINS AND SPROCKETS



Engineered to withstand the tremendous suspended weight and driving action of pulpwood barking drums and give dependable service, Link-Belt SS-850 steel chains keep barking drums turning.

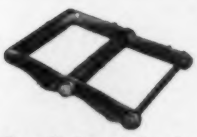
Typical chains from the complete LINK-BELT line

Class SS bushed roller chain with straight sidebars —for practically any conveying or elevating service.



Class H Pintle chain—excellent for conveyors that slide, used plain or with attachments.

Class SS bushed roller chain with offset sidebars —for heavy drive service at moderate speeds.



Class H drag chain—for drag conveyors, handling sawdust or other refuse in runways or troughs.

FREE

From Western Precipitation—the organization that pioneered the commercial application of Cottrell Precipitation...

IF YOU ARE ENGAGED in any phase of industry where the recovery of dusts, fumes, fly ash, mists, fogs or other suspensions from gases is a problem, you will find this booklet on the COTTRELL Electrical Precipitator helpful and informative.

Western Precipitation pioneered and installed the first commercial application of the well-known COTTRELL Electric Precipitator—Dr. Cottrell, the inventor, being a member of the company. And for more than 42 years Western Precipitation has consistently led in developing new COTTRELL advancements and techniques for recovering suspensions from gases, both wet and dry.

This 28 page booklet summarizes many of the basic facts you should know about modern COTTRELL Precipitators—the various types available, how they operate, principal types of electrode systems and rectifiers, shell constructions, etc. As long as the supply lasts, a free copy will be sent you on request to our nearest office. Ask for Bulletin No. C 103.

28 PAGES of helpful facts to know about **COTTRELL ELECTRICAL PRECIPITATORS**

Packed with helpful COTTRELL Information!

This Western Precipitation Cottrell booklet is designed to answer questions of design engineers, plant engineers and others interested in applying Precipitators to the recovery of industrial dusts and mists. It discusses such subjects as . . .

- Basic types of Cottrell Electric Precipitators.
- Principal parts of a Cottrell Precipitator.
- Mechanical and Electronic Rectifiers.
- Various types of Collecting Electrodes (rod curtains, corrugated plates, dual plates, pocket electrodes, etc.).
- Removal of Collected Material.
- Factors in Shell Construction (steel, concrete, brick, etc.).
- Operating Efficiencies and the Effect of Various Factors on Performance.

. . . and many other basic Cottrell facts. Write for your free copy of Bulletin C103 today while supplies are adequate!

Western Precipitation is not affiliated with any other company in the field of electrical precipitation except its wholly owned subsidiaries, International Precipitation Corporation and the Precipitation Company of Canada, Ltd. Whether you are now contemplating the installation of a Cottrell Electrical Precipitator, or may be interested in such an installation at a future date, we can and will serve you in any part of the United States or other countries.

NOW SELLING

COTTRELL Precipitators
MULTICLONE Collectors
TURBULAIRE Spray Dryers

...in all parts of the U. S. A. and foreign countries.

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

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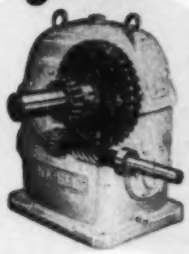
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

Get the one speed reducer that best fits your job

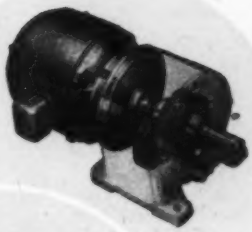
LINK-BELT builds all three types of enclosed gear drives

NO ONE speed reducer solves *every* reduction problem. That's why Link-Belt builds all three — Worm, Helical and Herringbone Gear Drives. Your Link-Belt power transmission engineer will recommend the *right* reducer for your needs.

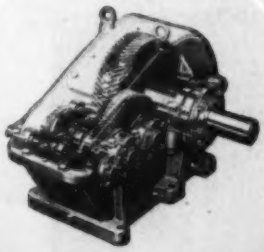
You can be sure you get the one that suits all your requirements for ratio, space, shaft position, shock loading and many other factors. Precision-engineered for quiet, economical power transmission, all Link-Belt drives will give you long service under the toughest operating conditions.



On Worm Gear Drives, write for Book 2324-A



On Gearmotor and Helical Gear Drives, write for Book 2247

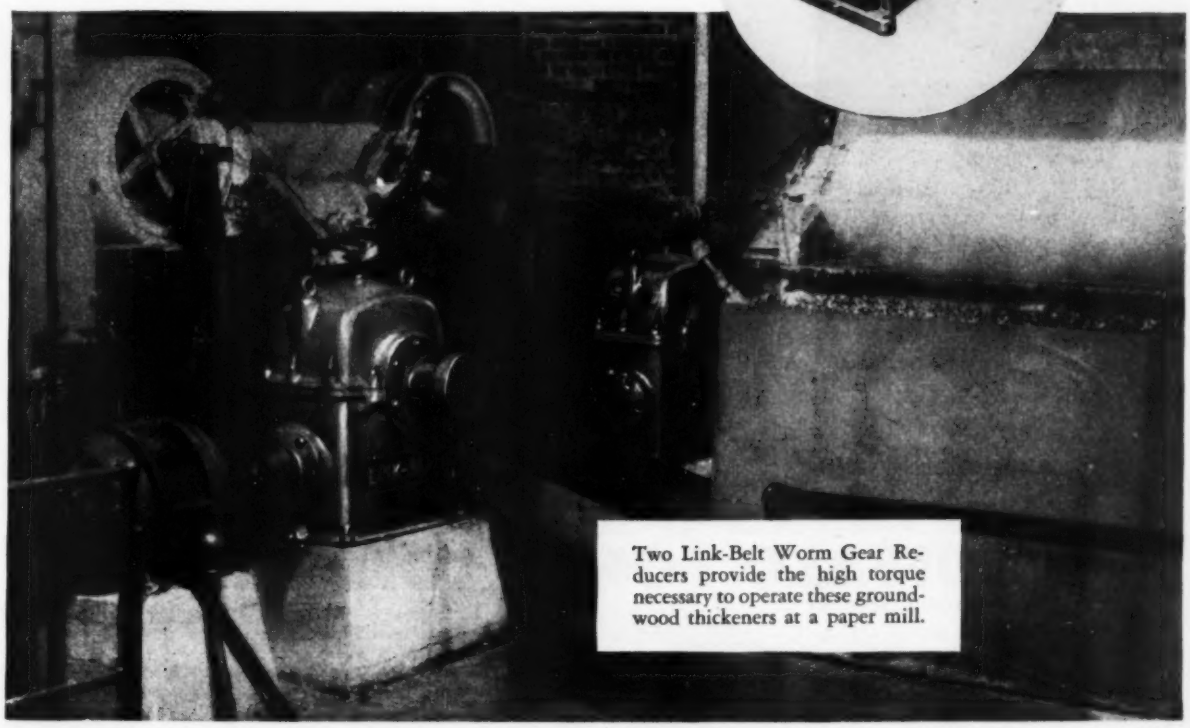


On Herringbone Gear Drives, write for Book 2419

LINK-BELT

ENCLOSED GEAR DRIVES

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in principal cities. 12.498



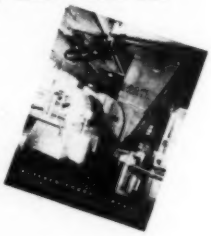
Two Link-Belt Worm Gear Reducers provide the high torque necessary to operate these groundwood thickeners at a paper mill.

Further Proof That "Buffalo" DRAFT FANS LAST LONGER And Save Money!

. . . THESE FANS IN CHAMPION PAPER AND FIBRE CO.'S OLD BOILER PLANT WERE BUILT IN 1917!

Built in 1917, installed in Champion's boiler house in 1925, these "Buffalo" Forced Draft Fans were on regular service until 1931 . . . and were still in good enough condition to be on standby service ever since!

As power engineers know, this is an endurance record for forced draft fans. It is not a lone case. "Buffalo" installations, industry-wide have been saving money for their owners through endurance — less trouble on the power run — fewer timeouts — longer life. Why not write for Bulletin 3750 and see what up-to-date "Buffalo" draft fans offer you?



WRITE FOR YOUR COPY

"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

213 MORTIMER ST. BUFFALO. N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Sales Representatives in all Principal Cities

VENTILATING FORCED DRAFT | AIR WASHING COOLING | AIR TEMPERING HEATING | INDUCED DRAFT PRESSURE BLOWING | EXHAUSTING

WHERE WILL THEY ATTACK IN YOUR PLANT?

MACHINERY STORED OUTDOORS
Problem Corrosion
Answer Insul-Mastic Vinyl System

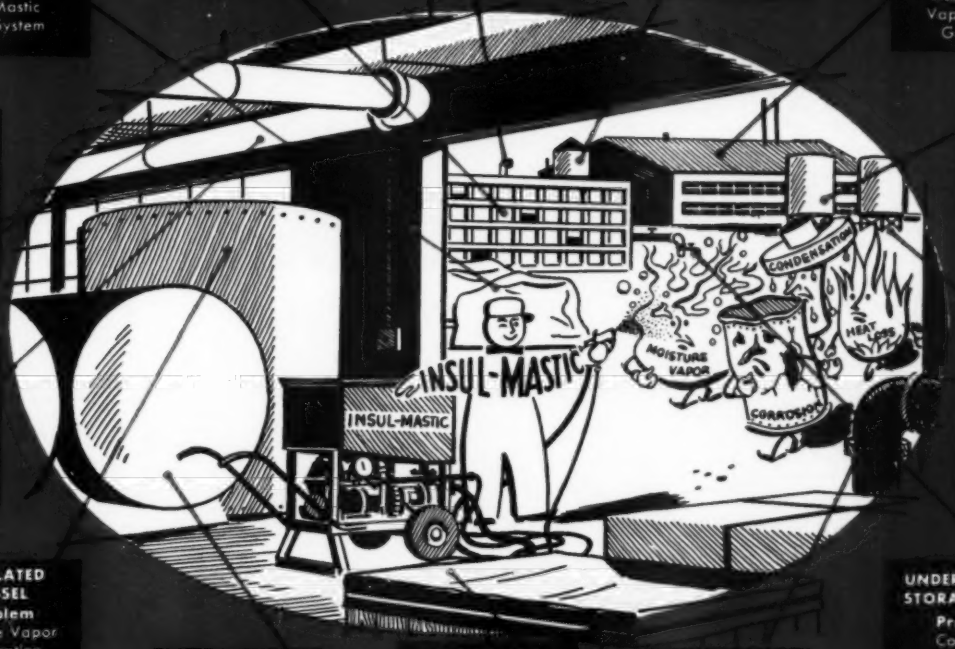
LEAKING WALLS
Problem Moisture
Answer Insul-Mastic Vaporseal & Granules

CORROSIVE VAPOR OUTLET
Problem Corrosion
Answer Insul-Mastic Vaporseal

WATER TANK
Problem Corrosion
Answer Outside—Insul-Mastic Vaporseal Inside—Insul-Mastic Vinyl

LEAKING ROOF
Problem Moisture
Answer Insul-Mastic Vaporseal & Granules

WARM AIR DUCT
Problem Heat Loss
Answer Insul-Mastic Type "D"



MODERATE TEMPERATURE STORAGE TANK
Problem Heat Loss and Corrosion
Answer Insul-Mastic Type "D"

INSULATED PIPE
Problem Moisture Vapor Penetration
Answer Insul-Mastic Vaporseal

STRUCTURAL STEEL
Problem Corrosion
Answer Insul-Mastic Vaporseal

INSULATED VESSEL
Problem Moisture Vapor Penetration
Answer Insul-Mastic Vaporseal

ACID TANK
Problem Corrosion
Answer Insul-Mastic Vaporseal

CRATES AND CARTONS FOR OVERSEAS SHIPMENT
Problem Moisture and Salt Air
Answer Insul-Mastic Packaging Glues

COLD WATER INTAKE PIPE FOR BOILERS
Problem Condensation
Answer Insul-Mastic Type "D"

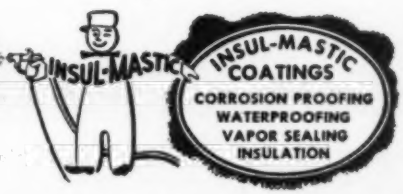
UNDERGROUND STORAGE TANK
Problem Corrosion
Answer Insul-Mastic Vaporseal

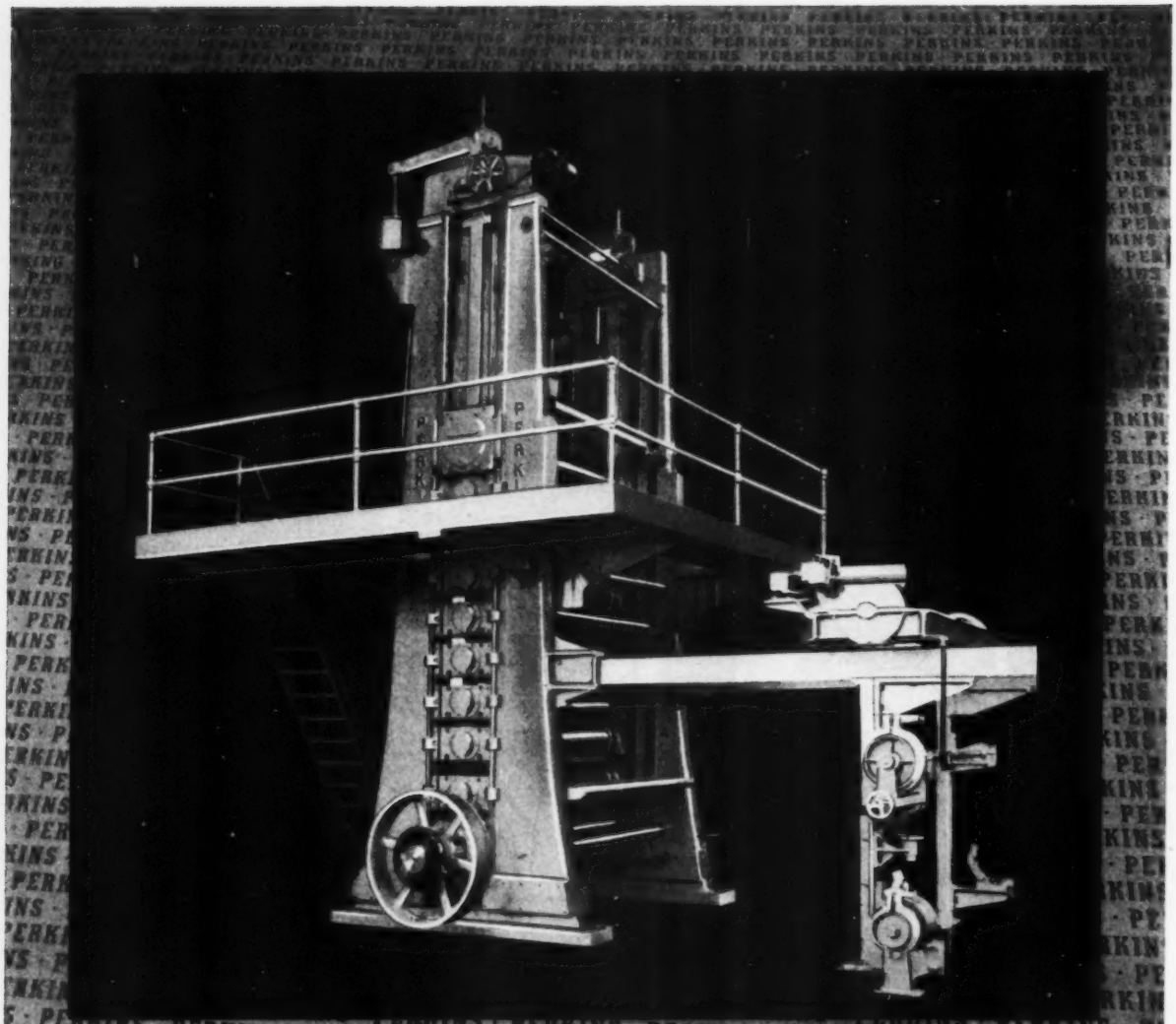
PROTECT YOUR EQUIPMENT WITH
INSUL-MASTIC
COATINGS OF UNEQUALED QUALITY

You can't select a heavy coating of better quality than Insul-Mastic. Its ingredients were specially chosen for their stubborn resistance to acids, alkalis, weather and wear. Insul-Mastic is homogenized for smooth spraying without blobs or pinholes. *Write today for our catalog.*

Think first of the coatings that last!

Insul-Mastic Corporation
OF AMERICA
1157 OLIVER BUILDING · PITTSBURGH 22, PA.
Representatives in Principal Cities





TEN TO FOURTEEN

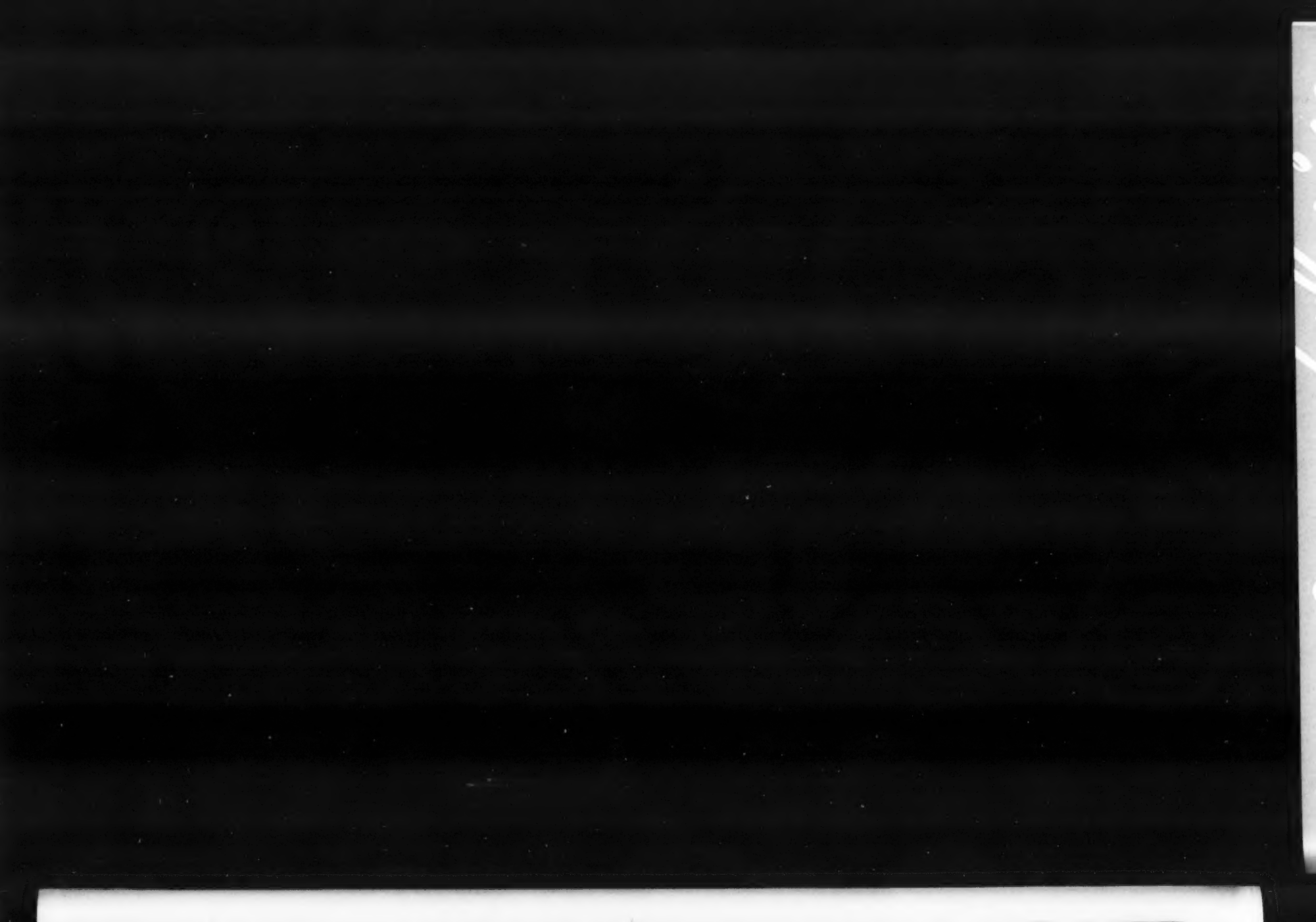
Perkins ten-roll 64″ face Web Supercalender with provision for fourteen (14) rolls.

- All rolls in Timken anti-friction bearings
- Stationary reel with electric hoist
- Lever pressure with pneumatic loading
- Fly rolls mounted in self-aligning anti-friction bearings
- Motor driven hoist for raising and lowering rolls

B. F. PERKINS & SON, Inc.

HOLYOKE, MASS., U.S.A.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD



An Overwhelming Preference

for DIAMOND Automatic Cleaning OF CHEMICAL RECOVERY BOILERS

Diamond Automatic Soot Blowers have been sold for the cleaning of chemical recovery boilers in the following plants. This list covers all but three or four of the black liquor jobs placed in the United States and Canada in recent years. The reason for this overwhelming preference? You obtain correct recovery boiler cleaning and high boiler availability at minimum cost by using Diamond Automatic Soot Blowers.

Bloedel, Steward & Welch, Ltd.
Brompton Pulp & Paper Co.
Brown Company
Brown Paper Mill Company
Brunswick Pulp & Paper Co.
Cakasieu Paper Company
Camp Manufacturing Company
Canada Paper Company
Cellulosa Koncern (Sweden)
Champion Paper & Fibre Co. *(2 Plants)*
Chesapeake Corporation
Companhia Portuguesa de Celulose (Portugal)
Consolidated Paper Company
Container Corporation of America
Continental Can Company
Crossett Paper Mills Ltd.
Crown Williamette Paper Co.
Dryden Paper Company
Enso-Gutzeit Oy (Finland) *(2 Plants)*
Fibre Board Products Corp.
Frazer Company, Ltd.
Gaylord Container Corp.
Gulf States Paper Company
Halifax Paper Company
Hollingsworth & Whitney Co.
Hudson Pulp & Paper Co.
International Paper Corp. Southern Kraft Division *(7 Plants)*
Kalamazoo Vegetable Parchment Co.
Longlac Pulp & Paper Co.
Longview Fibre Co.
H. R. MacMillan Export Corp. Nanaimo Sulphate Pulp Div.
Macon Kraft Company
Marathon Paper Company
Mead Corporation *(2 Plants)*
Mo and Donsjo A. B. Husums (Sweden)
National Container Corp. *(3 Plants)*
National Paper Corp.
North Carolina Pulp Co.
Oxford Paper Company
Pacific Mills Limited
Rauma-Raahe Oy (Finland)
Riegel Carolina Corp.
St. Helen's Pulp & Paper Co.
St. Joe Paper Company
St. John's Sulphite, Ltd.
St. Mary's Kraft Corp.
St. Regis Kraft Corp.
St. Regis Paper Co. *(2 Plants)*
Howard Smith Paper Mills, Ltd.
Sorge Pulp Co., Ltd.
Southern Advance Bag & Paper Co.
Southern Paperboard Co.
Thilmany Pulp & Paper Co.
Union Bag & Paper Co.
Union Corporation, Ltd. (S. Africa)
United Paper Company (Finland)
S. D. Warren Co.
West Virginia Pulp & Paper Co. *(2 Plants)*
Weyerhauser Timber Co. *(3 Plants)*

Only DIAMOND Offers You All This Application Experience

DIAMOND POWER SPECIALTY CORP.
LANCASTER, OHIO
Diamond Specialty Limited • Windsor, Ontario

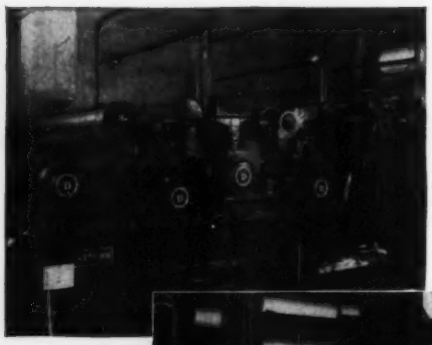
4664

There is a DIAMOND SOOT BLOWER for Every Boiler Cleaning Requirement

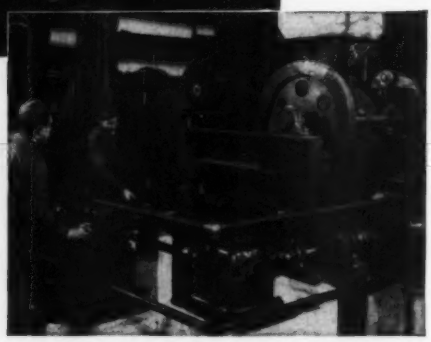
Downingtown Heavy Duty Duplex Board Slitter.

cutting and slitting

ACCURATE and FAST ...to match today's HIGH SPEED board machines



Downingtown High Speed Cutter and Slitter.



P.I.V. and chain drive eliminate belts and pulleys.

To handle the production of modern board machines with a minimum of lost time and sheet spoilage, Downingtown has developed the highly accurate... high speed Duplex Cutter and Slitter. It easily handles a wide range of sheet lengths at a tolerance of ±1/64".

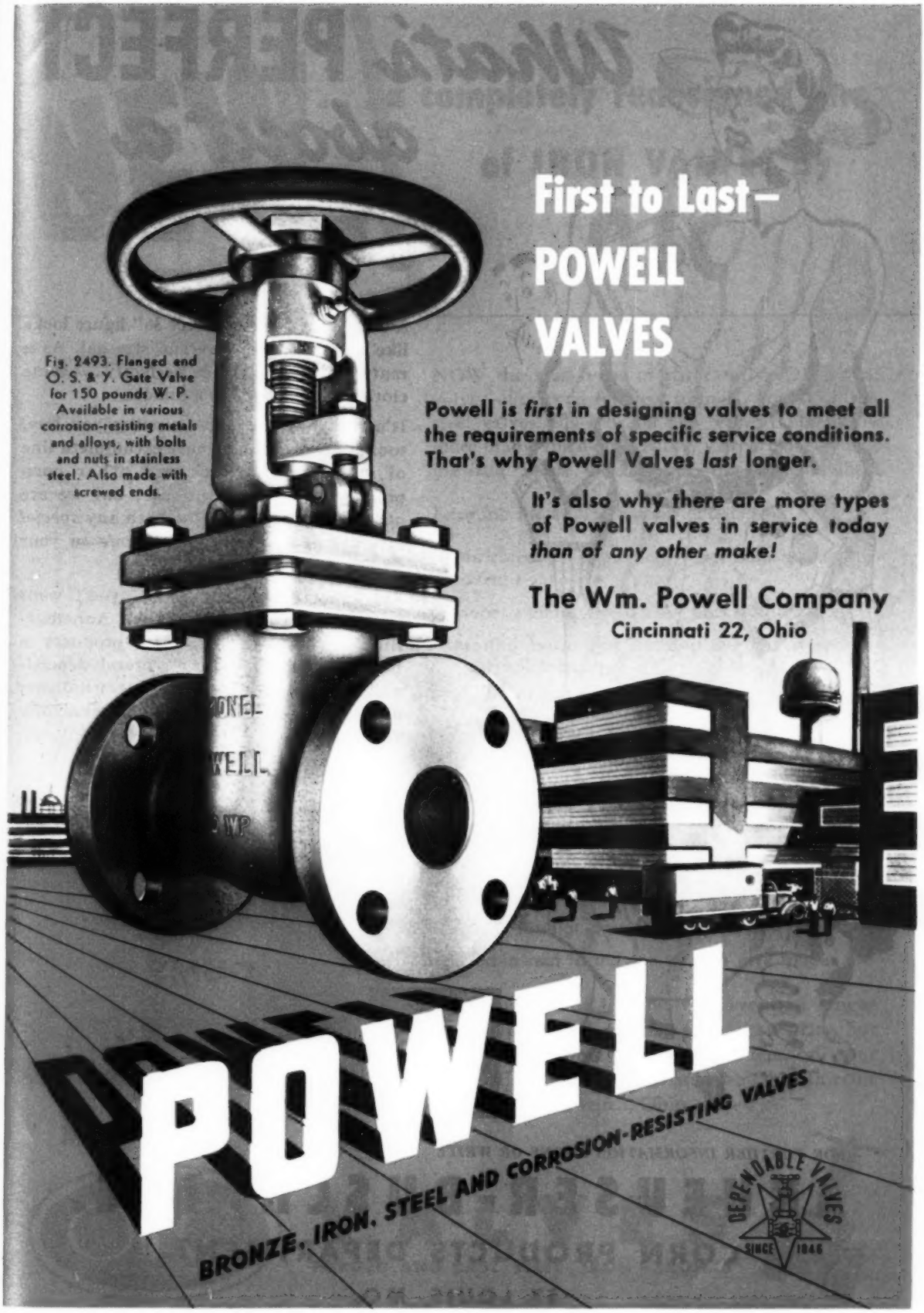
The Downingtown Slitter is compact, easy to operate and to maintain, practically noiseless, and produces a clean accurate sheet free from "fanning". Anti friction bearings are furnished throughout.

Write for detailed specifications of a typical Downingtown Duplex Cutter and Slitter.

DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.
Pacific Coast Representative: John V. Rasland, Pacific Bldg., Portland 4, Oregon

DOWNINGTOWN
CUTTERS AND SLITTERS

DESIGNERS AND BUILDERS OF PAPER, BOARD AND FELT MACHINES SINCE 1880


First to Last–
POWELL
VALVES
Fig. 2493. Flanged end O. S. & Y. Gate Valve for 150 pounds W. P. Available in various corrosion-resisting metals and alloys, with bolts and nuts in stainless steel. Also made with screwed ends.
Powell is *first* in designing valves to meet all the requirements of specific service conditions. That's why Powell Valves *last* longer.
It's also why there are more types of Powell valves in service today *than of any other make!*
The Wm. Powell Company
Cincinnati 22, Ohio
POWELL
BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES
DEPENDABLE VALVES
SINCE 1846

What's PERFECT *about a* 36?

A dress that fits a "perfect 36" figure looks like a tent on the average size gal. As a matter of fact . . . to fit *perfectly* . . . some clothes have to be tailor-made.

It's that way with the supplies you buy, too. For instance, we have a complete line of standard starches and other corn products for paper mill use; but we are *also* set up to provide you with any *special* formula or product, *tailor-made* to your specifications.

And . . . standard or special . . . you'll want to buy from a company like Anheuser-Busch, whose reputation for products of highest quality, uniformity and dependability is as dominant in the paper industry as it is with retailers and consumers all over the world.

CORN STARCHES
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CORN SYRUPS

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ANHEUSER-BUSCH, INC.

CORN PRODUCTS DEPARTMENT

ST. LOUIS, MO.

NEW . . . a completely redesigned line of IRON VALVES by OIC

NOW the workhorse of the family—OIC's iron valve—offers you features formerly found only in steel valves. It's a brand new valve built around more than a third of a century's experience in making iron valves. We kept only the old handwheel.

Examine these construction details:

1 Lubricated yoke bushing, renewable without removing bonnet.

2 Deeper stuffing box; longer packing life.

3 Inserted back seat bushing permits repacking under full pressure.

4 Stronger body-bonnet joint; uniform gasket compression.

5 Better metal distribution, reduced weight, increased strength.

6 Sturdy tie-ribs; added resistance to pipeline stresses.

7 End-seated bronze seat rings will not loosen in service.

8 I-Beam type solid wedge, accurately guided.

9 Straight-through port areas reduce flow resistance

10 Rolled-in seat facings on wedges give longer life.

OIC's new line of Iron Valves gives you longer service, lower upkeep and greater security. For Bulletin 805 telling you all about them, call your local OIC distributor or write The Ohio Injector Company, Wadsworth, Ohio.

OIC FOUNDED 1883

VALVES

FORGED AND CAST STEEL · IRON · BRONZE

VALUE in a fine product reflects the experience and skills of its makers.

VALUE in Fourdrinier wires is a matter of record... paper quality and production records in mills throughout America reflect the fact that *Appleton Wires are Good Wires!*

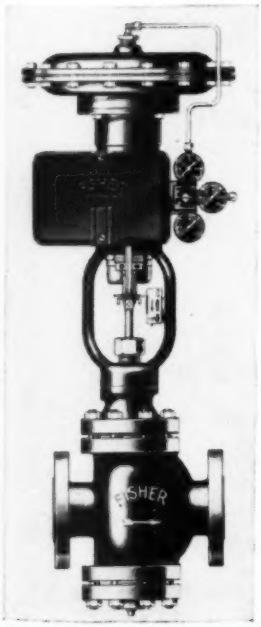
APPLETON WIRE WORKS, INC.
APPLETON • WISCONSIN

For Restricted Flow Requirements

3 STANDARD METHODS OF RESTRICTING INNER VALVES

FISHER®

DIAPHRAGM CONTROL VALVES



Reasons for using restricted trim: (1) where later conditions require either larger or smaller capacities, (2) a full sized valve body is desired for line strength but with low capacity requirements — Fisher 3 standard methods offer a quick, economical and completely satisfactory way of solving these problems.

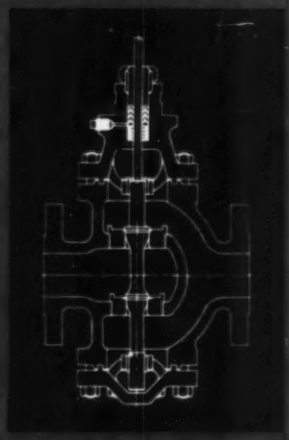
Size of restriction available: Restricted Inner Valve ports should be held to minimum size of not less than 50% of standard port diameter for valve body size, or equivalent of 25% of maximum full size valve capacity.

Practical considerations have proven it is undesirable to reduce flow to less than 25% of maximum capacity of body in double ported valves.

FISHER GOVERNOR COMPANY
Marshalltown, Iowa

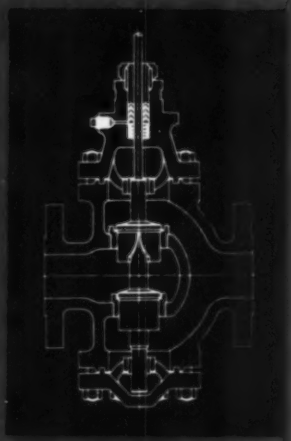
FOR TOP AND BOTTOM GUIDED THROTTLE PLUG INNER VALVES

Restricted Throttle Plug with port diameters reduced. Full distance between seats. Reduces minimum control flow to that of restricted port size.



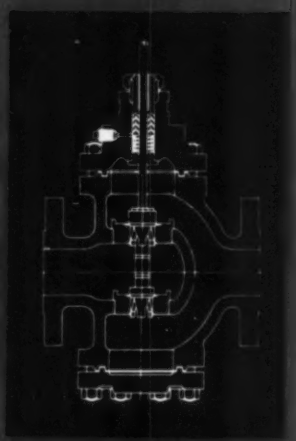
FOR TOP AND BOTTOM GUIDED V-PUP INNER VALVES

Restricted V-Pup with full port diameters, but with restricted slots. Full distance between seats. Allows for quick, easy change in field — no need to change seat rings.



FOR SKIRT GUIDED INNER VALVES

Restricted Quick Opening or V-Port Inner valve with port diameters reduced. Full distance between seats.

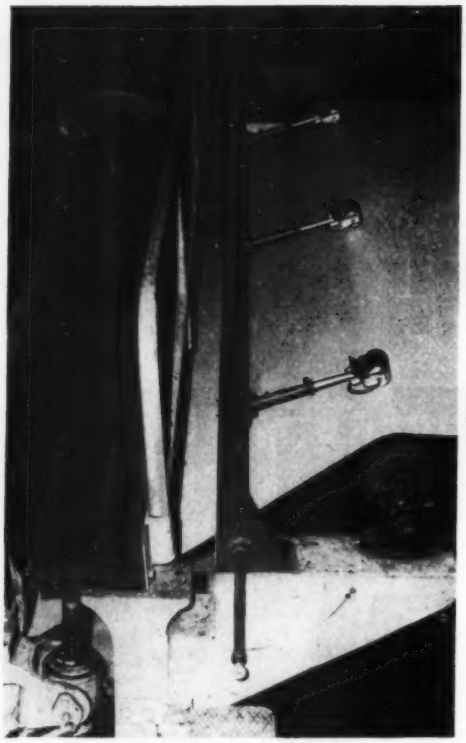


FISHER®
LEADS THE INDUSTRY IN RESEARCH FOR BETTER PRESSURE CONTROL

Control It

HERE

and you get MAXIMUM QUALITY and ECONOMY



When you maintain control automatically of wet end caliper on board and heavy paper you accomplish several important things. Your finished sheet is consistently uniform in caliper. Weight to plus or minus 1½% is maintained through a caliper range of 5 to 150 points. Result . . . a higher quality, more saleable product. And, at the same time you are cutting costs to the bone. Stock loss is reduced to a minimum. Man and machine hours are more nearly 100% productive.

Here's how the Hurletron Caliper and Weight Control provides all these advantages . . . automatically.

- Holds wet end fluctuations to plus or minus one point.
- Measures thickness at 40" intervals clear across the sheet.
- Makes corrections by regulating flow of stock but only when a trend has been established.
- Provides a continuous, permanent record of wet end caliper.
- Signals operator when a drift across the sheet is indicated.
- Provides a continuous reading and record at the dry end.

Ask for Illustrated Bulletin

Our Bulletin No. 211 shows what Hurletron equipment is doing in leading mills. Includes full details, charts, and illustrations. Write for your copy today . no obligation.

HURLETRON
Automatic
CALIPER and WEIGHT CONTROL

ELECTRIC EYE EQUIPMENT COMPANY

10 WEST FAIRCHILD STREET, DANVILLE, ILLINOIS

CURLATION will upgrade pulp

and...

Save Pulpwood
Save Coal
Save Sulphur
Save Limestone

CURLATION of No. 1 Sulphite Pulp will

Increase Cleanliness
Increase Porosity
Increase Softness
Increase Stretch
Increase Tear

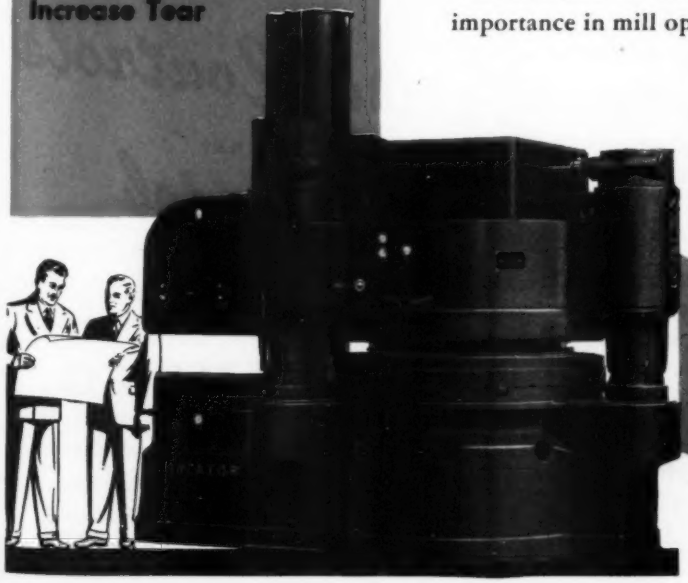
Now, with our Curlator we actually transform glorified screenings into quality pulp!

Before the advent of Curlation there were three grades of pulps: No. 1 sulphite, No. 2 sulphite and fine screenings. *Now* with Curlation there is only *one* grade—*No. 1 sulphite.* Curlation has converted No. 2 sulphite and fine screen rejects into No. 1 sulphite pulp.

Thus the pulp has been upgraded with an increased sales value. Also the yield of No. 1 sulphite has been increased. In addition savings are being made in coal, limestone and sulphur.

In these days of rising costs and material scarcity the inclusion of a Curlator in your production line is of topmost importance in mill operation.

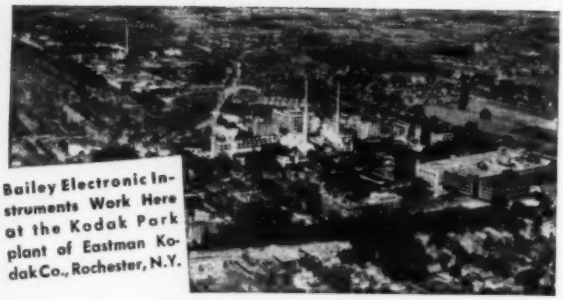
WRITE today for more detailed information on what a Curlator can do for you.



CURLATOR* Corporation
349 BLOSSOM ROAD · ROCHESTER 10, NEW YORK

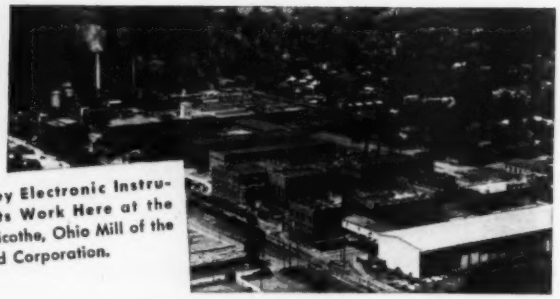
*T.M. Reg.— Curlator Corporation, Rochester, N. Y.

Bailey Electronic Instruments Work Here at the Lake Charles, La. plant of the Mathieson Chemical Corp.



Bailey Electronic Instruments Work Here at the Kodak Park plant of Eastman Kodak Co., Rochester, N.Y.

alkali OR FILMS



Bailey Electronic Instruments Work Here at the Chillicothe, Ohio Mill of the Mead Corporation.

Bailey Electronic Instruments Work Here at the Midland, Michigan plant of The Dow Chemical Company.

paper OR CHEMICALS

★ No matter what you process it will pay you to check into the Bailey simplified electronic control system.

With four basic circuits and eight basic component parts you can get more than 100,000 different electronic instrument and control combinations. Your problems of measuring and controlling flow, level, speed, pressure temperature, gas analysis, pH, conductivity, etc., can be solved by the right combinations of these 4 circuits and 8 basic parts.

You don't have to load up a stock room with parts. Bailey parts are interchangeable. What you used for the last combination is good for the next one when conditions in your plant change. You can save money, as others are doing, when you standardize on Bailey controls.

Bulletin No. 17 will show you how easy it is to install and use Bailey electronic controls. Write for your copy today.

you'll find Bailey Controls on the job

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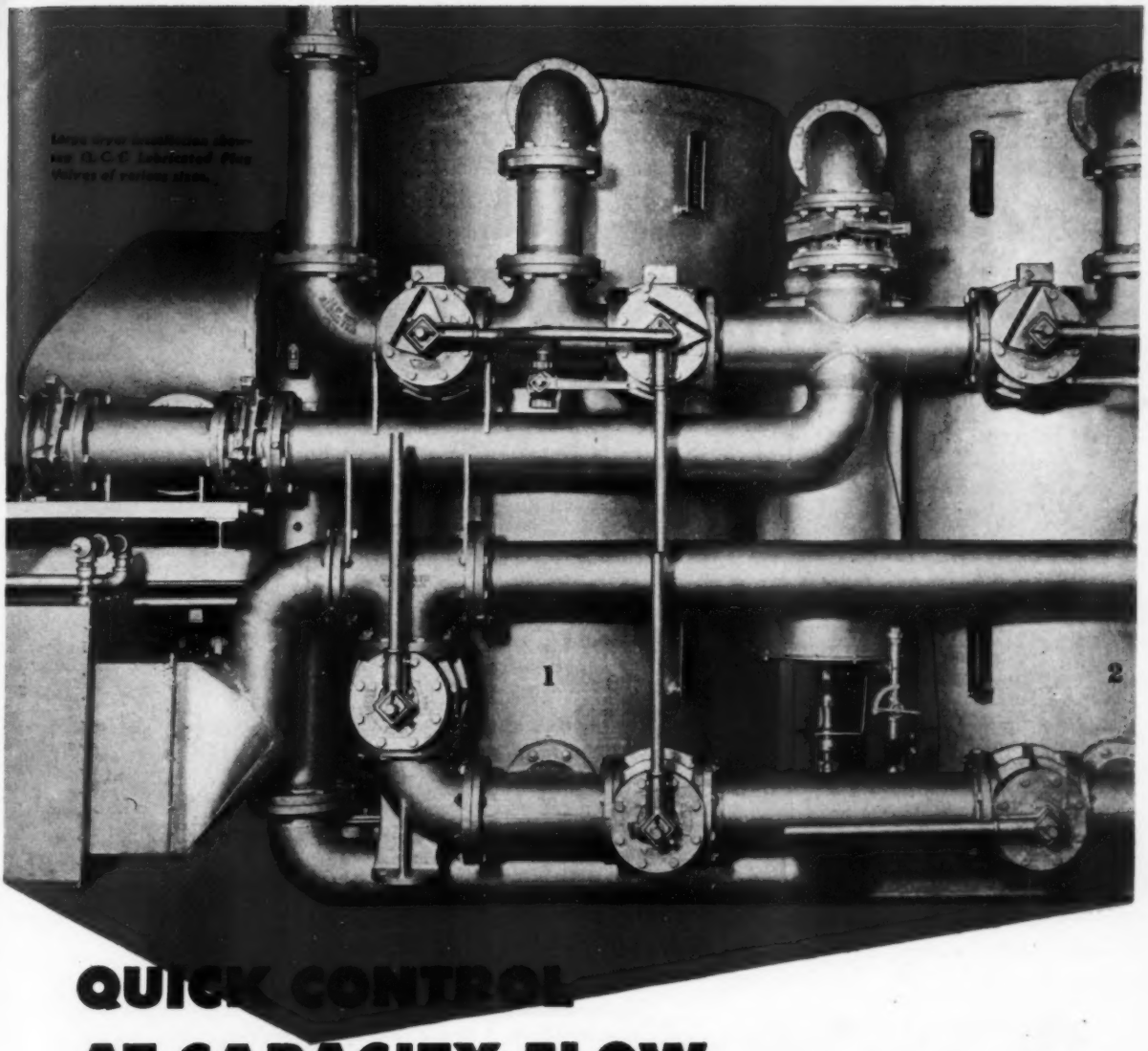
Bailey Meter Company Limited, Montreal, Canada

Controls for the Process Industries

TEMPERATURE • FLOW • PRESSURE

GAS ANALYSIS • LEVEL • RATIO



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Many industrial processes require full pipe line capacity of fluids—for economical, efficient operation... and at the same time quick control. For such service, a.c.f. CYLINDRICAL Lubricated Plug Valves are the answer—straight-through full pipe area flow with quick, quarter-turn, tight shut-off. Only a.c.f. Valves have all these features.

a.c.f. CYLINDRICAL FULL PIPE AREA **PLUG VALVES**

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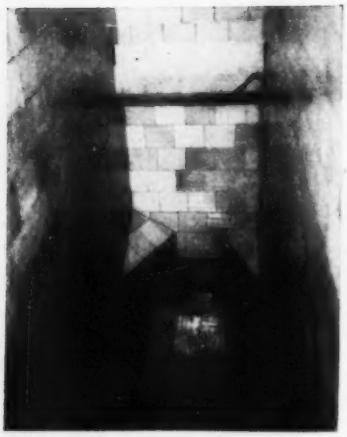
WHY *Kalamazoo* TILE TANKS ARE YOUR BEST INVESTMENT



An old chest may be made as clean and shining as this with *Kalamazoo* tile lining.

● **SMOOTH SURFACES** Unusually free-flowing, easily cleaned, not affected by ordinary stock fluids.

● **EXTRA STRONG** *Kalamazoo* Tile Tanks may be designed for any load or pressure or even as part of building.

● **DURABLE** The first *Kalamazoo* Tile Tanks installed over 20 years ago show no signs of deterioration today.

● **ECONOMICAL** For most installations, *Kalamazoo* Tile Tanks cost no more than reinforced concrete, last far longer.

● **MINIMUM MAINTENANCE** No chipped concrete to repair, no slime to remove, no rusted metal, no tightening of hoops.

● **"PIONEER" CONSTRUCTION** Over 20 years ago *Kalamazoo* engineers pioneered in designing and building vitrified glazed tile tanks — the standard of quality today in the paper industry.

Kalamazoo tile is made in all shapes necessary for original construction or conversion of any type tank, chest, or storage building. A single contract covers Kalamazoo engineering and construction service, giving you the protection of undivided responsibility. On any tank problem, write or call Kalamazoo first.

Cylindrical *Kalamazoo* tile tank.

Kalamazoo Tile circulating chest ready for installation of concrete cover slab for support of equipment.

Kalamazoo TANK and SILO COMPANY

1127 HARRISON STREET • KALAMAZOO, MICHIGAN

COLORED *wrappings are advertisements for the store*

Smart retailers have discovered that *colored* wrappings give them an *extra way to advertise.* Distinctively colored cartons, wrapping paper and shopping bags identify the store at a glance. Each one is an advertisement on the streets, in buses and streetcars . . . and in the home.

But many retailers are still using nondescript paper and boxes. Tell them about the advertising plus *your wrappings—in color*—can give them . . . and corner your share of a big potential market.

Our Technical Staff will be glad to help you choose the proper dyes, from a large selection of excellent, light-fast, economical dyestuffs. Write today for complete information to E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.

More color makes more business ...for your customers and you

DU PONT BASIC DYES
Du Pont Safranine T Ex. Conc. 125%
Du Pont Rhodamine 5GDN Extra
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Du Pont Rhodamine B Extra
Du Pont Auramine Conc.
Du Pont Chrysoidine GN
Du Pont Victoria Pure Blue BO
Du Pont Methylene Blue ZX

DU PONT ACID DYES
Du Pont Orange 11 Conc.
Du Pont Orange RO

DU PONT DIRECT DYES
Du Pont Purpurine 4B Conc.
Pontamine* Fast Scarlet 4BS Conc. 150%
Pontamine* Yellow SXP Conc.
Du Pont Stilbene Yellow G Conc.
Du Pont Stilbene Yellow GCB Conc.
Pontamine* Fast Orange WS Conc. 175%
Pontamine* Orange R Conc.
Pontamine* Black E Double
Pontamine* Brown D3GN Conc. 125%

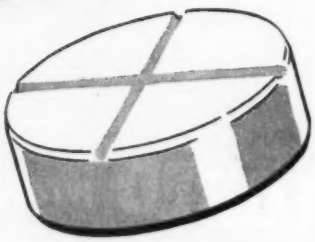
*REG. U. S. PAT. OFF.

Du Pont Dyestuffs

DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Vanzyme discs



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STACK AND HANDLE

STARCH CONVERTER

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TUB AND CALENDER SIZING
COATING AND
LAMINATING ADHESIVES

Increase
ACCURACY
ECONOMY
EFFICIENCY
AND SPEED

R. T. VANDERBILT CO., Inc.

230 Park Avenue, New York 17, N. Y.

The Paper Industry

November 1951

Safety means more than preventing accidents

Each year in October, the National Safety Congress serves to focus attention on one of industry's most important problems—accident prevention. From the standpoint of safety alone the subject deserves all the attention it can get from top management. But when we consider the corollary effects of a good safety program the importance is even more pronounced.

Practically every mill that develops a good safety record finds that in so doing it has also improved its labor-management relations. For it takes genuine interest and human understanding on the part of management to bring about the cooperation so necessary in making supervisors and employees work wholeheartedly together in a cause that requires constant thought and endeavor.

It's not enough to merely appoint a safety director, set up a safety program and assent to the idea of spending time and money on safety. Management's attitude must be as positive and direct as it is toward production, operating and maintenance costs, research, etc. Management must wholeheartedly support and participate in every safety effort because the individual in the plant is quick to detect indifference or preoccupation. Where accident prevention is handled in a negative fashion the worker's response to the safety program will be negative. So, it goes without saying that direct participation by all levels of management in a safety program helps break down the barriers to understanding which so often are at the bottom of labor strife.

A good safety program helps promote good housekeeping. In fact, one hardly exists without the other and it is almost a foregone conclusion that a mill with poor housekeeping also will have a poor safety record.

While safety probably has no direct effect on production, it is true that an accident-free mill is more likely to have higher efficiency than a plant where safety is ignored. At least, that's the experience of the West Virginia Pulp and Paper Company, Williamsburg, Pa., whose safety achievement in winning THE PAPER INDUSTRY'S Fritz Memorial Trophy is described in succeeding pages. Here it was reported that actual production efficiency rose during the no accident period experienced by that mill since December 6, 1948. Full cooperation and safe, careful workmanship developed as a basis for accident prevention undoubtedly had a salutary effect on raising production.

The attitude of West Virginia Pulp and Paper Company's employees is reflected in our report of interviews shown on pages 919-921 of this issue. Where individual interests of top management, supervisors and workers meet together in a mutual enterprise the result is more than a good safety record.

For Your Beater . . .
Better

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- Sodium Thiosulfate *(Hypo)*
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The Paper Industry Current Comment

Paper board demand off

Radical changes have developed in the paper and paperboard markets during the last few weeks, with a wide divergence between the demand for papers and paperboards. The demand for paperboard has fallen off so rapidly that prices for waste paper have receded sharply. On the other hand, the market for fine and wrapping papers continues strong, though without the sharp pickup that usually comes after the Labor Day holidays. The steady decline in new orders for paperboards is a result in part of the recession in textile and other consumer goods industries.

Government buying has been heavy as stocks of all grades of papers are being built up at the new installations in the United States and in the far flung ring of air bases abroad. Present indications are that paper and paperboard production in 1951 will reach the unprecedented high figure of 27,000,000 tons, whereas a normal increase in consumption, due to increasing population, should indicate a need for about 24,000,000 tons, basing this figure on unchanged per capita consumption. In other words, the 1951 output appears to be in some measure at least a building up of inventories, possibly among large consumers, as well as for Government estimated needs.

Southern expansion stimulates reforestration

The fear expressed in the South that the expansion of the paper industry threatens extensive deforestation in that area has been met by the mills with a showing that the building of new mills has resulted in the most elaborate and wide-spread efforts to develop reforestation programs ever seen in an area of comparable size. Hundreds of thousands of acres of forest land are now under scientific forest management, with every effort of the owners being devoted to establishing such cutting programs that over a period of years the forest lands will be more rather than less productive. No new paper mill enterprise has been inaugurated in the South without a program to establish a maintained growth on the tributary woodlands. Instead of depletion, the mills say the program, practically universal in the South, will result in increasing instead of depleting the amount of standing timber in these forests.

This fear of depletion, however, is having a direct effect on the proposal of the Bowater interests to build a $45,000,000 newsprint mill in Tennessee. Government agencies, Forest Service and National Defense Production, are holding back on authorization of certificates of necessity for this new mill principally on the question whether there is enough timber available in the area contiguous to the site of the proposed mill to justify its being built without adverse effects on these woodlands areas.

Newsprint economy

The remands of the newspaper publishers for increases in newsprint production are facing some backfire in Congress. The suggestion has been made that the newspapers serve themselves by cutting down the size of their publications. Attention has also been called to the waste due to excessive numbers of copies placed on news stands which remain unsold. It is estimated that thousands of tons of newsprint are wasted in this manner.

Legislation affecting industry

With the adjournment of Congress until January, there will be a relief from the uncertainties of possible legislation adversely affecting business. However, the past session is having its repercussions. The passage of the tax bill materially increasing corporate taxes is a definite impairment of the incentive to industrial development. Failure to repeal the disputed Capehart provision of the price control law will mean a flood of tailored orders for every industry. Such orders are already in the making for various grades of paper, and it is estimated that the number of tailored orders for all industries will run as high as 500. To prepare these orders means either an expansion of the personnel in the defense agencies, or a delay in effecting changes vital to industry.

Labor

The labor picture is anything but encouraging. Labor is now moving for still another round of wage increases. It is evident that labor interests are in the saddle at Washington. This can only mean further increases in costs of production and consequent increases in prices of goods for sale. How to check this vicious cycle is a problem for saner minds than appear to be in control at Washington.

Potomac Fever is the name now being given to the attitude of personnel in the Government agencies at Washington and in the outlying branches of these agencies. Potomac Fever is a trend toward socialism and is proving the bane of this age.

Financial reports

A sudden drop in industrial securities the week end of October 20 was accompanied by a reduction in prices for paper mill securities. The drop appeared to be the result of the newly passed tax bill and the international developments in the Middle East.

Paper mill corporate changes

Celanese Corp. of America has offered through Dillon, Read & Co., Inc., $50,000,000 in 3½ per cent debentures due October 1, 1976, at 100 and interest. Celanese will use $19,750,000 of the proceeds to redeem its outstanding 2¾ per cent serial notes due 1953-58. It will add the rest to its general funds to be used in part for plant additions and equipment.

Freeport Sulphur Co. stockholders have approved a three-for-one split of common stock, which was effective September 21. Also approved was an increase in the total of authorized stock from the present 850,000 shares to a total of 3,000,000 shares, retaining the $10 par value.

Hollingsworth & Whitney Co. has registered 100,000 shares of its no par common with the Securities and Exchange Commission.

Kimberly-Clark Corp. has filed a registration statement with the SEC covering the offer of 102,424 shares of its $100 par 4 per cent convertible preferred. The firm plans to offer these shares in exchange for its outstanding 4½ per cent cumulative preferred on a share-for-share basis.

Mead Corp. has called its outstanding 4 per cent cumulative second preferred stock beginning December 1 at $55.50 a share. The conversion right of the second preferred expires December 1. Common

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The rugged Fawick actuating element automatically compensates for wear of friction shoes. This insures complete engagement and dependable service from Fawick clutches and brakes.
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Even friction-shoe wear reduces lost production time for clutch or brake maintenance. After long periods of satisfactory service, only the friction shoes need be replaced.
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A Fawick clutch or brake of the correct type and size to meet your machine design and operating requirements is the best solution to your application problem. Check with Fawick before you buy.
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INDUSTRIAL CLUTCHES AND BRAKES

stock issued in conversion of the second preferred up to November 13 will be eligible for common stock dividends, payable December 1.

West Virginia Pulp & Paper Co. has filed a registration statement with the SEC for $20,000,000 of 20-year debentures for public offering through a group headed by Harriman, Ripley & Co., Inc.

Net incomes

Container Corp. of America—Net income for the first nine months of 1951 was $11,247,000 as compared to $7,328,000 last year.

Central Fibre Products Co.—Net income for the fiscal year ended June 30 was $2,826,139, compared to $2,176,363 last year.

Central Paper Co. of New York—Net income for the year ended June 30 was $546,157 as compared to a loss of $246,191 last year.

Diamond Alkali Co.—Net income for the first nine months of 1951 was $5,662,112, compared to $2,654,833 for the same period in 1950.

Oxford Paper Co.—Net income for the nine months ended September 30 was $2,223,448, against $2,176,294 in 1950.

Rhinelander Paper Co.—Net income for the nine months ended June 30 was $1,061,442, compared to $1,043,318 last year.

New York Stock Exchange—Stocks
(Closing Prices)

	Oct. 20, 1951	Sept. 20, 1951
A. P. W. Products	6¼	7½
Celotex	18	19⅜
Same Preferred	175/8	17¼
Certain-teed Products	17	17⅜
Champion P. & F. Co. (new)	* 27–27½	* 29½–29¾
Same Preferred	*102¼–102½	102
Chesapeake Corp.	37⅞	* 38–38½
Continental Diamond	16	15⅛
Container Corp.	36¾	40¼
Same Preferred	* 98¾–100	*101½–103
Crown Zellerbach	54½	56
Same Preferred	*100¾–101¾	*102–102⅝
Dixie Vortex	73⅝	72¾
Eastern Corp.	28	28
Robert Gair	18⅝	17⅝
Same Preferred	* 19¼–19¾	19½
Gaylord Container	31	35
International Paper	50	51⅞
Same Preferred	* 98½–100½	102
Kimberly-Clark	48	49½
McAndrews & Forbes	43½	42⅝
Marathon	53⅛	51⅝
Masonite	37⅛	34½
Mead Corp.	27¾	29¾
Same Preferred	* 93–93¾	102
Same 2nd Preferred	* 67–71	* 73–80
National Container	13½	13⅞
Rayonier, Inc.	57⅞	59⅛
Same Preferred	* 36⅜–37¼	36⅞
Scott Paper	* 52⅛–53⅛	58¼
Same $3.40 Preferred	*100–100⅞	* 88½–90
Same $4.00 Preferred	* 90–92	*102½–104⅜
St. Regis	17⅜	17½
Same Preferred	* 93–95	* 93–95
Sutherland Paper	25½	27
Same Preferred	110	108¼
Union Bag & Paper Co.	47½	50⅜
United Board & Carton	18¼	* 16¾–17½
United Wall Paper	3½	4
Same Preferred	25	* 26–26⅝
U. S. Gypsum	*117½–118	115½
Same Preferred	*171–174	*173¼–178
West Va. P. & P. Co.	* 81–83	98
Same Preferred	*107–108½	*107–108½

New York Stock Exchange—Bonds

A. P. W. Products	.....	.....
Celotex 3½%	.....	.....
Champion P. & F. Co. 3%s	.....	.....
Mead Corp. 3%s	.....	.....

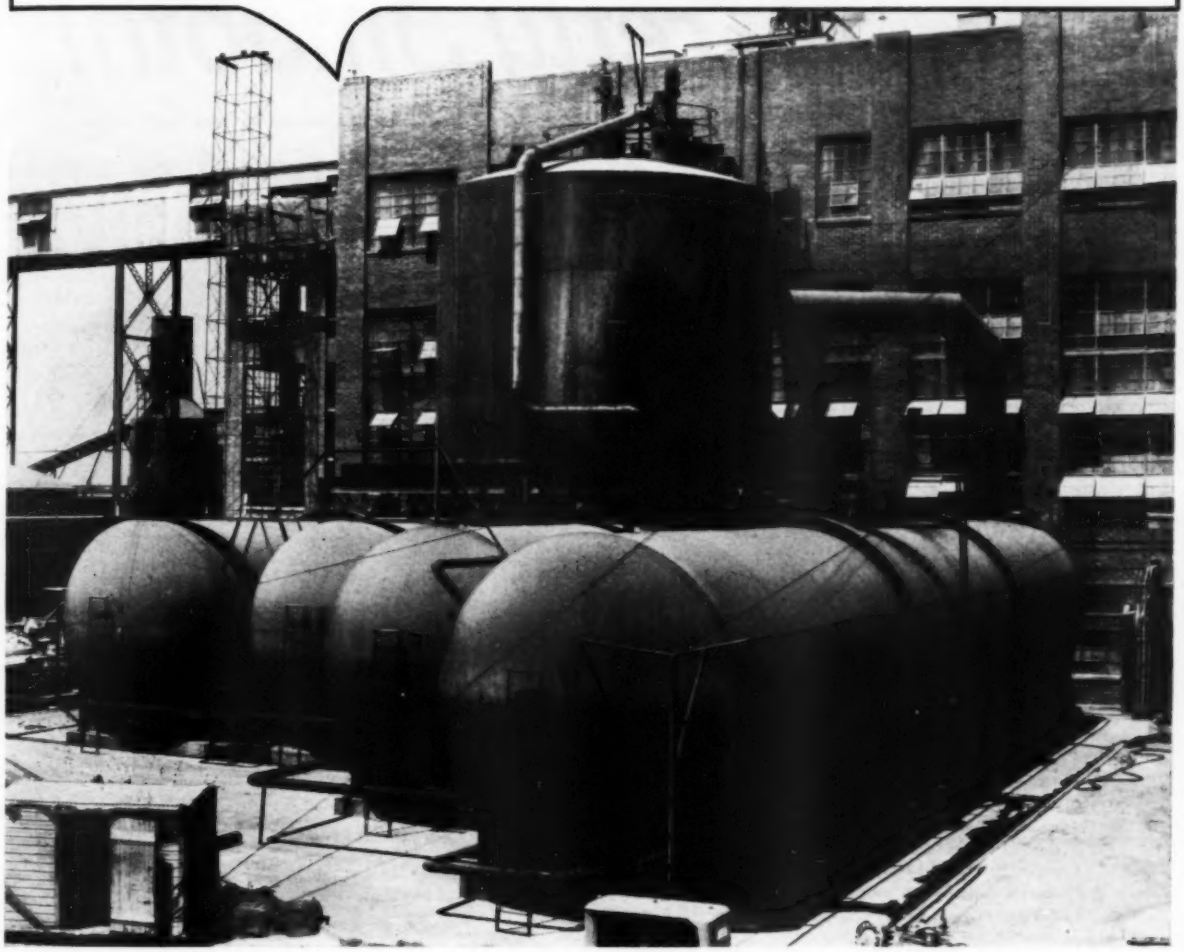
New York Curb Exchange—Stocks

Am. Writing	11⅜	11¼
Great Northern	55	56⅜
Hammermill	40	43

*Closing Bid and Asked Prices.

Brown Stock Washing System

UTILIZES HORTON WELDED STEEL TANKS



THE Macon Kraft Company at Macon, Georgia, is one of the South's important producers of kraft board. Last year its daily output was over 600 tons with a single day's production record of nearly 650 tons.

Several specially fabricated Horton tanks and processing structures play an important part in the integrated operation of Macon Kraft Company's pulp mill, chemical recovery plant and wood yard. Among these units are six 4300 cu. ft. Horton digesters, two 600-ton storage tanks, a blow tank, an accumulator, a burned lime tank, an elevated water tank, and the four seal tanks and foam tank pictured above.

The seal tanks are used in the brown stock washing system. Filtrate from four-stage washers discharges into them through barometric legs that create vacuum for the washers. Surmounting the seal tanks is a foam tank equipped with twin centrifugal foam breakers.

Whether you are modernizing existing facilities or building an entirely new plant, consider Horton tanks and processing structures.

The above view shows one 18-ft. by 100-ft. seal tank, one 18-ft. by 80-ft. seal tank, two 18-ft. by 60-ft. seal tanks, and a 32-ft. by 25-ft. foam tank fabricated and field-erected by Chicago Bridge & Iron Company for Macon Kraft Company.

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Birmingham, 1.....1511 North 60th Street
Boston, 10.....1026—201 Devonshire Street
Chicago, 4.....2445 McCormick Building
Cleveland, 15.....2267 Guildhall Building
Detroit, 26.....1566 Lafayette Building
Houston, 2.....2143 National Standard Building
Los Angeles, 17....1559 General Petroleum Building
New York, 6.....3350—165 Broadway Building
Philadelphia, 3....1653—1700 Walnut Street Building
Salt Lake City, 4.....527 West 17th South Street
San Francisco, 4.....1547—200 Bush Street
Seattle, 1.....1327 Henry Building
Tulsa, 3.....1651 Hunt Building
Washington 6, D.C.....1138 Cafritz Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

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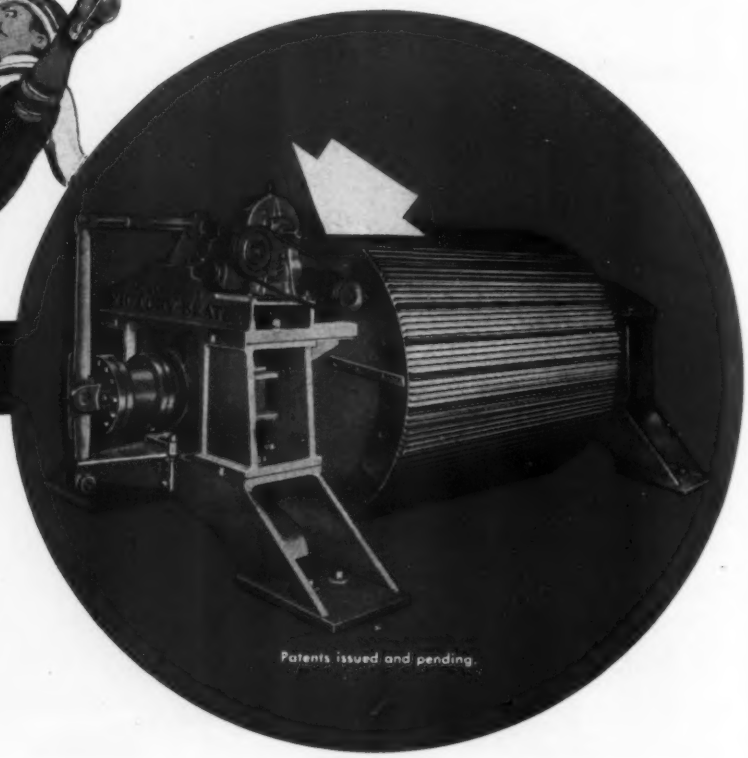

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The Paper Industry News of the Industry

Slump in Paperboard Indicates Paper Thaw

Although demand remains high, a combination of factors has indicated a general relief from the paper shortage brought about after the outbreak of war in Korea. The result of a recent survey undertaken by *The Wall Street Journal* demonstrates that this over all easing in the paper pinch has been led by a downtrend in production of paperboard, which accounts for more than 25 per cent of paper consumption.

Paperboard orders booked during the week ended October 20 were off about 14 per cent from 1950. This slump in the product which is the traditional barometer as to the general health of the paper industry, seems to indicate that an easing off in the paper shortage is in the offing. There is belief among producers that other papers—notably kraft and even newsprint—may show a slackening in the not too distant future.

In addition to the drop in paperboard orders, a recent survey has shown that unfilled orders were off over 40 per cent, while production is down about 7 per cent. This is a continuation of the trend that had its beginnings in mid-August.

Following closely the tumble in paperboard trade was a similar easing in kraft sales. Where kraft was practically unobtainable in the open market during February and March at a New York, N.Y., price of 24½ cents a pound, there were purchases at 14½ to 16½ cents during the latter part of October.

Manufacturers Cut Production

Among large producers of paperboard who have indicated the general slack in trade is Robert Gair Co., Inc., which is taking spot orders and can usually start shipments in one or two weeks. International Paper Corp. has recently returned its Hartford City, Ind., jute board mill to "standby status." Three mills of United Board & Carton Corp. have dropped from full-capacity, six-day schedules to between five and six days, while two of the firm's carton plants in New York have cut back about 25 per cent.

One of the most accurate signs as to the condition of the paperboard industry —the Chicago waste paper market—has given good indication in recent weeks of the general slack. Brokers in October were quoting mixed paper, largest single waste paper grade, at $10 to $12 a ton delivered at the mill. The same grade brought a high of $33 only last December.

Paper Demand Still High

Demand for most kinds of paper is still maintaining a fast pace—officially. Paper prices, as measured by the Bureau of Labor Statistics, are up 20 per cent from a year ago. The overall level of commodity prices has advanced only 5 per cent in the same period. And thus far there have been no appreciable drops in contract prices for paper. However, in the "black market," where bids are usually far above contract level, there have been a number of instances of reduction.

Newsprint, in short supply for a number of months, is a good example of conditions in the "black market" trade. Where newsprint last spring brought from $265 to $300 a ton in East Coast cities, the current quotation is $200, still, however, far above the official contract price of $116.

The sag in the "black market" for newsprint is understandable when recent supply figures are considered. North American production in the first nine months was approximately 4,939,000 tons, about 5.4 per cent above the same period in 1950. At the same time, consumption was only 4,333,500 tons, about the same as a year ago. At the end of September publishers reported adequate stocks on hand to meet operating needs for 41 days. In 1950 at this time stocks were sufficient for only 37 days.

Kraft Shows Possible Change

Although kraft paper manufacturers have noted no drop comparable to that which has taken place in paperboard, consumers have indicated that an alteration of the situation may be on the way.

A Midwestern manufacturer of kraft bags reports demand has fallen somewhat in a few lines—notably bags for department stores and dry cleaning establishments. A West Coast producer of multi-wall bags is reported to be accepting all the business he can get. Wolf Detroit Envelope Co. finds it now takes only four to six weeks to get delivery from the mill. William F. Murphy's Co., Philadelphia, reports deliveries of top grades are fairly well back on schedule. Cheaper grades, tightest in recent weeks, are beginning to loosen up. However, prices in all grades are still firm.

However, manufacturers have not as yet felt the effects of the reported drop in demand. Union Bag & Paper Corp. is still operating its Savannah, Ga., mill on a three-shift, seven-day-a-week basis. A spokesman for St. Regis Paper Co. has indicated that that firm is still producing at top capacity.

On the other hand, Hammermill Paper Co., Erie, Pa., has felt no easing in demand for pulp papers for such uses as ledgers, index and mimeograph work. Hammermill is reported to be operating at capacity, six days a week, with all orders on allocation.

Production Capacity on Increase

In recent years the U.S. production and consumption of paper have grown steadily. Total capacity now stands at approximately 24,500,000 tons a year, about 6 per cent above 1948 and nearly 50 per cent above 1939. In the mean

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time, per capita consumption has risen more sharply than the industry has expanded. While manufacturing has jumped nearly 50 per cent, consumption has soared close to 57 per cent. Last year 381 pounds of paper were consumed for every man, woman and child in the country.

Notable expansion projects in the industry include those of International Paper, which has hiked capacity some 22 per cent to 3,640,811 tons a year since the end of 1945; National Container Corp., which has increased its production to about 270,000 tons a year, a 53 per cent boost since the close of World War II. And huge expansion plans are in the works, with industry sources having estimated that domestic capacity for making many types of paper will have increased by nearly 2,000,000 tons by the end of 1952. For example, Rome Kraft Co. has started construction of a $25,000,000 mill near Rome, Ga., which will have a capacity of 650 tons of liner board a day, while National Container Corp., is constructing a 500-ton per day kraft pulp, board and paper mill near Valdosta, Ga., which will cost an estimated $25,000,000.

Paper Mill President Sees Business Slack

Credit restrictions and higher corporation taxes imposed recently by the United States government were cited recently by D. W. Ambridge as signs that some lessening of business activity is imminent. Mr. Ambridge is president of Abitibi Power & Paper Co., Ltd. He stated recently in a letter to stockholders that such government actions are bound to result in a slackening demand for a great many products.

Although Abitibi's business continues good, Mr. Ambridge warned that conditions in general, and particularly in the U.S., indicate a slight depression in industrial activity. A drought in British Columbia, unprecedented in history, has seriously affected the reserves of logs in the lumber and pulp and paper industries. However, he added, every effort is being made to maintain production of finished goods.

Mill Expansion Continues as 60-Day Moratorium is Terminated

Termination of the 60-day moratorium on the issuance of tax amortization certificates was announced October 18 by the Defense Production Administration. Under terms of the order, certificates of necessity will be issued on construction commenced after November 1, 1950, only if DPA has, prior to the beginning of construction, made a determination as to shortage of facilities and essentiality of the product.

Other provisions include the adoption of a formal system of priorities for processing applications based on essentiality of product; review of applications on file and canvass of applicants to determine whether construction has been commenced or is still contemplated, and treatment within priority groups to be based on the extent of the particular shortage involved.

The moratorium was instituted August 18 by DPA at the request of Charles E. Wilson, director of the Office of Defense Mobilization, in light of the serious shortage of critical materials.

Mead-Inland to Build $25 Million Mill in Georgia

Construction is to begin immediately on a $25,000,000 container board mill on the Coosa River near Rome, Ga., which will produce more than 200,000 tons a year. Builder of the facility is Rome Kraft Co., newly organized by Inland Container Corp., Indianapolis, and Mead Corp., Dayton, Ohio. The new mill will produce kraft container board used by Inland and others in manufacturing corrugated shipping containers.

The plant was designed by Rome's engineering staff. The contract for construction was awarded to Maxon Construction Co., Dayton. The schedule calls for completion within 24 months. Some 650 persons will be employed when peak production is reached. Another 1,200 are to be employed in Rome Kraft's wood and woodland programs, where approximately 350,000 cords of wood will be procured annually. Pulp wood is to be obtained in northwest Georgia and parts of Tennessee and Alabama.

The mill site on the Coosa River was selected after an exhaustive search for a location that would provide ready access to a constant wood supply. The new company has acquired forestry rights over a wide territory. Graduate foresters will supervise wood procurement and assist in a conservation program conducted in cooperation with private land owners, state and federal agencies. The company will promote the artificial reforestation of lands where nature is unable to do an adequate job by planting and supplying seedlings to private land owners. A radio network is being developed to detect and report forest fires in the area.

President of Rome Kraft is Al H. Mahrt, a director in Mead Corp. Other officers are H. C. Krannert, vice president; H. A. Kidd, vice president and general manager; P. F. Holton, vice president; G. B. Elliott, secretary and assistant treasurer; George Robinson, treasurer, and Murray Smith, assistant secretary and counsel.

National Container Starts Georgia Mill Construction

Ground was broken recently for the 500-ton per day kraft pulp, board and paper mill National Container Corp. is building near Valdosta, Ga. The $25,000,000 project is being constructed on a 275-acre site about nine miles south of Valdosta.

Officials of National Container and of three states took part in ceremonies, which marked the beginning of work on the largest single industrial development ever undertaken in the south Georgia-north Florida area.

The mill and its ponding areas for handling effluents is on land acquired by the Lowndes County Chamber of Commerce with funds subscribed by local businessmen as an inducement for the firm to locate in the area. Through the system of ponding areas, dams and controlled flow—extending over a distance of five miles and a land drop of 150 feet—mill effluent will be constantly aerated before it reaches the nearest stream. Lowndes County, through a special act of the state legislature, is undertaking this sewage disposal project, which is being financed through a special revenue bond issue.

Among special guests present at the ceremonies were Samuel Kipnis, National Container president; Harry Ginsberg, executive vice president; Marshall Bernstein, secretary and general counsel; A. H. Edwards, vice president; W. T. Webster, vice president and general manager, and James Kipnis, vice president. Representing the contractors, Merrit-Chapman & Scott Corp., were A. A. Johnson, Miles C. McGough, Raymond Kopp, and Ralph Desimone. Clarke Gaines, secretary of the Georgia State Chamber of Commerce, spoke at a special banquet.

St. Regis Expansion

St. Regis Paper Co., New York, N.Y., has announced that construction has started on an addition to its multiwall bag plant at Pensacola, Fla. The expansion comprises a two-story structure measuring 360 by 144 feet and a one-story office section, measuring 36 by 360 feet, to house bag division services. The construction work is expected to be completed by late 1952.

The firm also reports good progress in its construction of a new bag plant at Tacoma, Wash., which will replace the leased plant that St. Regis is currently operating at Seattle. Occupying 81,600

square feet of floor space, the Tacoma plant is being built as an addition to the firm's kraft paper mill there. Construction is expected to be completed early next year.

St. Regis Paper Co. (Canada) Ltd. has announced the opening of its new $2,000,000 panelyte plant at St. Johns, Que. The new plant, which will supply the laminated plastics requirements of much of the Canadian market, covers 70,000 square feet and employs approximately 300 persons. Five presses are installed.

Crown Zellerbach Awards Contract for Cal. Plant

Crown Zellerbach Corp. has awarded Sherton & Walbert Co. a contract for the construction of a $3,000,000 paper converting plant at San Leandro, Cal. When completed in August, 1952, the 300,000-square-foot unit will produce annually 25,000 tons of such products as towels, napkins, grocery bags, multiwall bags, and miscellaneous tissue products. The plant is expected to employ about 200.

Certificates of Necessity

Groveton Papers Co., Inc.,
Groveton, N.H., has been issued a certificate of necessity by DPA for 60 per cent for sulphite pulp.

International Paper Co.,
Pascagoula, Miss., has received a certificate of necessity for 55 per cent for paper stock.

River Raisin Paper Co.,
Monroe, Mich., has been granted a certificate of necessity for 50 per cent for paperboard cases.

Fort Howard Paper Co.,
Green Bay, Wis., has been issued a certificate of necessity for 55 per cent for pulp.

Central Fibre Products Co., Inc.,
Hutchinson, Kan., has been granted a certificate of necessity for 50 per cent of $466,414 for pulp and paper.

Where the dollar value is not stated it is indicated that a portion of the facilities involved in the application was completed or acquired prior to September 23, 1950. In these instances, DPA action is taken in accordance with the provisions of the law, and action will be taken later on the remainder of the facilities involved.

St. Joe Paper Co.,
Port St. Joe, Fla., has placed an order with Research Corp. for the construction and installation of two wet bottom electrostatic precipitators for the handling of gases from two new spray type recovery furnaces, each designed to handle 138,000 cfm at 275-300F. The precipitators are part of a plant expansion program at St. Joe.

Buckeye Cellulose Corp.,
a wholly-owned subsidiary of Proctor & Gamble Co., has signed a contract for the purchase of 440,000 acres of pine land in northwestern Florida. The property will be used to expand capacity for production of cellulose pulp. Buckeye has also announced that it plans to construct a plant in Florida for the production of dissolving pulp from wood.

International Paper Co.
has announced that it has started construction of a research department building in Mobile, Ala., for its Southern Kraft Div. The technical staff will work at a project for finding new and varied uses for southern pine and by-products of southern kraft pulp and paper plants.

Standard Ore & Alloy Corp.
New York, N.Y., is planning to spend an estimated $500,000 on the rehabilitation of the pulp mill formerly owned by Chicoutimi Pulp Mills Ltd. at Chicoutimi, Que. Engineers for the project are Stadler, Hurter & Co., Montreal.

C. D. Johnson Lumber Co.,
Toledo, Ore., has announced that a new plant for the production of wood chips for pulp would go into operation at once. Production capacity is several carloads per day. Fir, hemlock, and spruce will be utilized to produce the raw pulp.

Berwin Paper Mfg. Co.
Danville, N.Y., recently purchased by Gannett Co., has announced the construction of an extension to the present building that will permit the conversion of part of the plant's facilities to the manufacture of newsprint.

American Writing Paper Corp.,
Holyoke, Mass., plans to move its general offices in the Flatiron Building to "modern quarters in an improved location" within the next year. The move is an extension of a program started a year ago to bring the Eagle-A offices close to the mills in an effort to improve operating conditions.

Paper Manufacturers Co.,
Philadelphia, has announced that its new Indianapolis plant is now complete and will be soon in full operation. The one-story plant is equipped to convert paper roll products and specialties. The new structure contains 40,000 square feet of floor space. General manager is Joseph A. Morris, formerly head cost accountant of Paper Manufacturers' main plant in Philadelphia.

Capac Plastics, Inc.,
Capac, Mich., has been taken over by a syndicate headed by Paul H. Travis, president of Rochester (Mich.) Paper Co. The firm manufactures thermosetting plastics. New officers include Mr. Travis, president and treasurer; David R. Stamy, vice president and general manager; Stanley Ceranski, vice president in charge of sales; James M. Henry, vice president and assistant general manager, and Nathan B. Goodnow, secretary and legal counsel.

Central Paper Co.,
Menasha, Wis., has announced the near completion of its new factory addition. The 100 by 100 foot structure is of reinforced concrete and steel with surface walls of brick and glass brick. The new building adjoins the present plant and will make possible straight-line production from the gumming machines through packing and shipping. The second floor is to be used to house printing equipment.

Federal Paper Board Co.
has purchased 21,000 square feet of land, with buildings, in Gogota, N.J. The property will be used for parking and storage space.

Manchester Board & Paper Co.,
Richmond, Va., is building a $100,000 waste paper storage unit. The concrete and steel structure will increase the company's storage space by 30 per cent.

Clearprint Paper Co.
has occupied a new $250,000 plant at Emeryville, Cal., substantially larger than its former headquarters in San Francisco.

Industrial Container Corp.,
Brooklyn, N.Y., has started construction in Baltimore, Md., of the first unit of a 60,000-square-foot factory. Completion is expected early in 1952.

Oregon Pulp & Paper Co.
has received a permit at Salem, Ore., to construct a ship storage building at a cost of $50,000.

Directors Approve Scott-Soundview Merger

Scott Paper Co., Chester, Pa., and Soundview Pulp Co., Everett, Wash., have announced jointly that their respective boards of directors have approved a plan whereby the two firms will merge. The move is subject to the approval of the shareholders of each company. Meetings for the purpose of voting on the proposal were scheduled for November 5.

The basis of the merger is to be the issuance of 1¼ common shares of Scott for each share of Soundview common. Under the proposed plan, the present Scott preferred and common shares will not be called in but will remain outstanding. The agreement provides that if the merger is completed according to schedule, Scott as the surviving corporation will pay a dividend on its common

shares in December at the rate of 60 cents per share, so that each Soundview common shareholder will be entitled to receive the equivalent of 75 cents per share.

Soundview's plant has a rated capacity of 600 tons per day. The pulp produced is well suited to the manufacture of Scott products.

Gaylord Merger Completed

Gaylord Container Corp., St. Louis, has announced acquisition of Fairfield Paper & Container Co., with plants in Baltimore, Ohio, and Beaver Falls, Pa., and of Dresden Paper Mills Co., Dresden, Ohio. The merger adds two paper mills and two container plants to Gaylord's operations, which now comprise three paper mills and 17 converting plants.

Gaylord's present plans call for normal operations at both Fairfield and Dresden, with Henry Custer continuing as vice president and general manager of the two firms. His headquarters are at Baltimore, Ohio.

Fairfield Corp. was organized in 1907 and manufactures liner board, chipboard, and corrugated boxes; while Dresden Co. was formed in 1916 to produce straw board.

Tight Newsprint Supply to Continue

Shortages of newsprint promise to plague United States publishers for some time to come. According to a spokesman for the American Newspaper Publishers Association, newsprint production in North America would have to expand at the rate of 3 per cent per year to keep pace with the demand. It has been estimated that by 1960 newspaper publishers would need 7,000,000 tons of newsprint. This compares with consumption of 5,937,000 tons in 1950 and an estimated 5,925,000 this year.

However, in the face of the severe shortage steps are being taken by industry and government alike to alleviate the situation through new construction, expansion and allocation. Recently Congressman Kenneth A. Roberts (Dem., Ala.) introduced a bill to authorize the Reconstruction Finance Corporation to make loans for the construction of newsprint plants. Such loans would not exceed 50 per cent of the construction cost of a mill.

Effects of Shortage Widespread

Effects of the current shortage in newsprint have been felt throughout the U.S. Four Boston newspapers agreed to a voluntary conservation proposed by NPA. The plan will save an estimated 7,000 tons a year. The agreement calls for the participating publishers to set a ceiling on the percentage of unsold newspapers. The "Boston Plan" was devised after a study made by NPA in 11 leading cities showed a wastage of part of 184,000 tons of newsprint in the difference between press runs and paid circulation.

The plan, according to NPA, would enable the newspaper industry to keep newsprint supply and demand in reasonable balance without resorting to such drastic measures as curtailing advertising or news space. The wastage problem has arisen chiefly in cities where there are competing newspapers.

A government-sponsored plan to save newsprint by voluntarily cutting down on the number of newspapers printed for street sale was disclosed to a House of Representatives committee recently. The plan was disclosed by Arthur Treanor, director of NPA's printing and publishing division.

Two New York, N.Y., newspapers, the *Daily News* and the *Times*, recently announced general rate increases for all advertising classifications. Company spokesmen for the *News* were quoted as saying that the new rates were necessary entirely "to cover the increased cost of newsprint." While in Denmark three Danish provincial newspapers have announced they will cease publication because of increased newsprint prices.

Paper Quota Opposed

Newspaper publishers recently urged the government not to increase the rate of emergency allocations of newsprint to foreign publishers while the domestic supply remains critical. The recommendation was made to NPA by the Newspaper Industry Advisory Committee.

Approximately 30,000 tons of newsprint have been earmarked for 15 friendly countries so far this year. Although the supply will continue "nip and tuck" for a time, according to NPA authorities, there probably will be no need of government control. Voluntary conservation is being discussed with publishers throughout the nation, especially in the Pacific Northwest, where the situation is serious due to the power shortage.

Expansion Plans Announced

Three major expansion and construction plans have been announced during the past several weeks. A group of West Coast newspapers who own the West Tacoma Newsprint Co. at Steilacoom, Wash., are planning to participate in financing an expansion program to double the newsprint production at the mill.

Berwin Paper Mfg. Co. at Danville, N.Y., recently purchased by Gannett Co., will construct an extension to the present building that will permit a portion of the plant's facilities to be devoted to the manufacture of newsprint. And Bowater Paper Corp., Ltd., Corner Brook, Newfoundland, plans to spend $50,000,000 on the construction of a 125,000-ton-per-year newsprint plant near Calhoun, Tenn.

Canadian Developments

The shortage of sulphur continues to hamper newsprint output in Canada. An official of the Canadian paper industry has warned that unless the NPA increases sulphur allotments to that country, paper and newsprint mills will lose 17 per cent of their possible production in the first nine months of 1952. The spokesman continued by noting that stocks of newsprint in the hands of U.S. publishers are beginning to pile up as consumption has leveled off after four years of steady increases. He added, however, that the situation is temporary, since production promises to be down next year.

Canada is increasing its newsprint capacity and will continue to do so, although the sulphur lack might prevent its full realization for a while. Labor is "tight" but adequate. Output in Canada for 1951 has been estimated at 5,525,000 tons, with mills operating at 103 per cent of rated capacity. Production in 1950 was 5,279,000 tons.

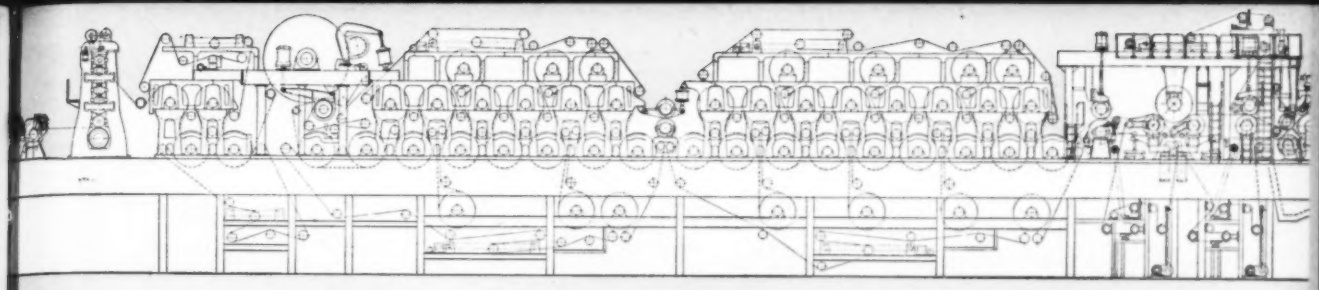
The Canadian government has decided to step up emergency allocations of newsprint to help countries in special need. The latest allocation will likely total 14,000 tons, bringing emergency diversions in the last few months to more than 20,000. At the same time Premier Duplessis of Quebec stated that he would welcome the establishment of a newsprint plant on the St. Lawrence North Shore exclusively for European customers. Canadian and European industrialists are interested in the plan.

Latin America

The Inter-American Press Association has been informed that seven Central and South American nations are taking steps to meet the newsprint shortage from their own resources. Cuban interests plan a $15,000,000 plant to manufacture newsprint from Bagasse, a waste product of the cane sugar industry. Brazil and Chile already have plants in operation and are planning others, while new factories have been decided on or studied in Mexico, Peru, Venezuela, and Guatemala.

Allocations of Newsprint to Foreign Nations Attacked

American publishers should not have to take from their own short newsprint



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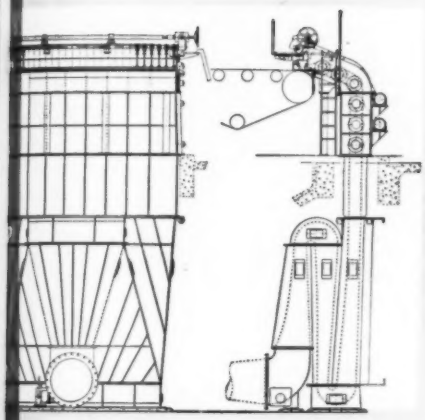

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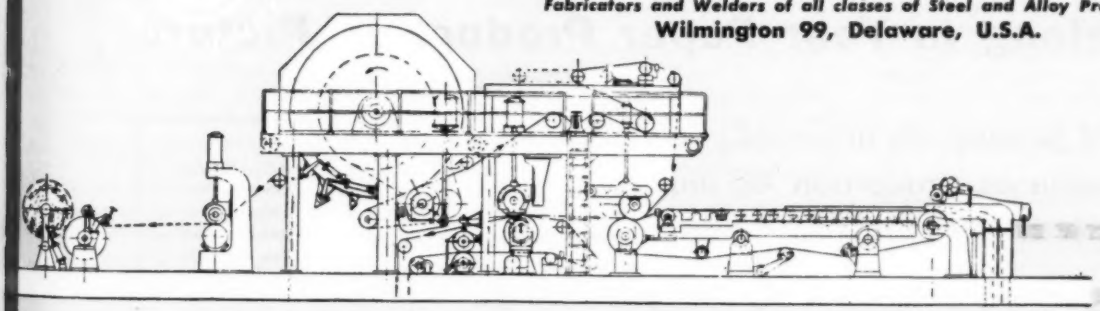

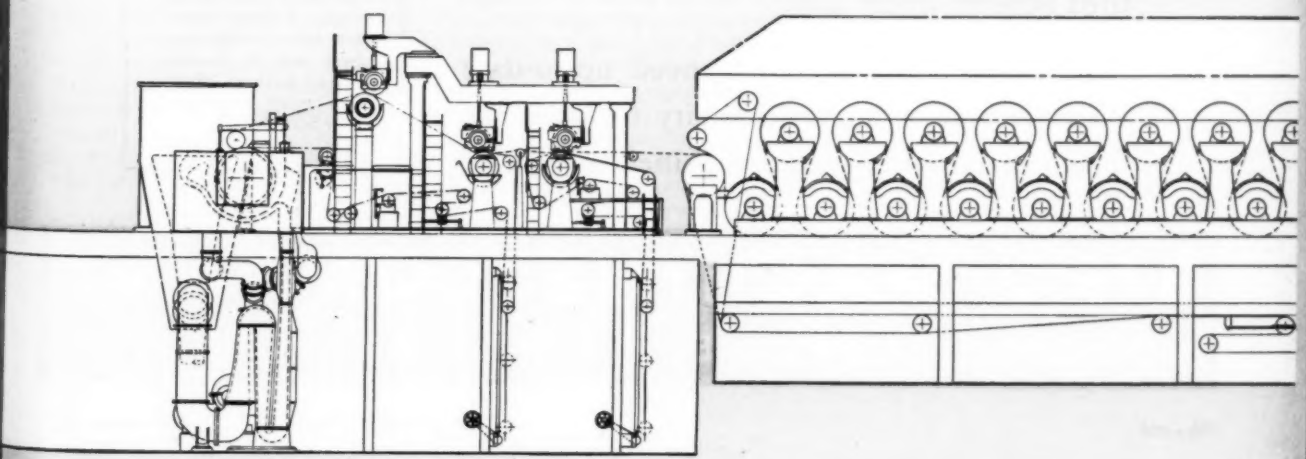

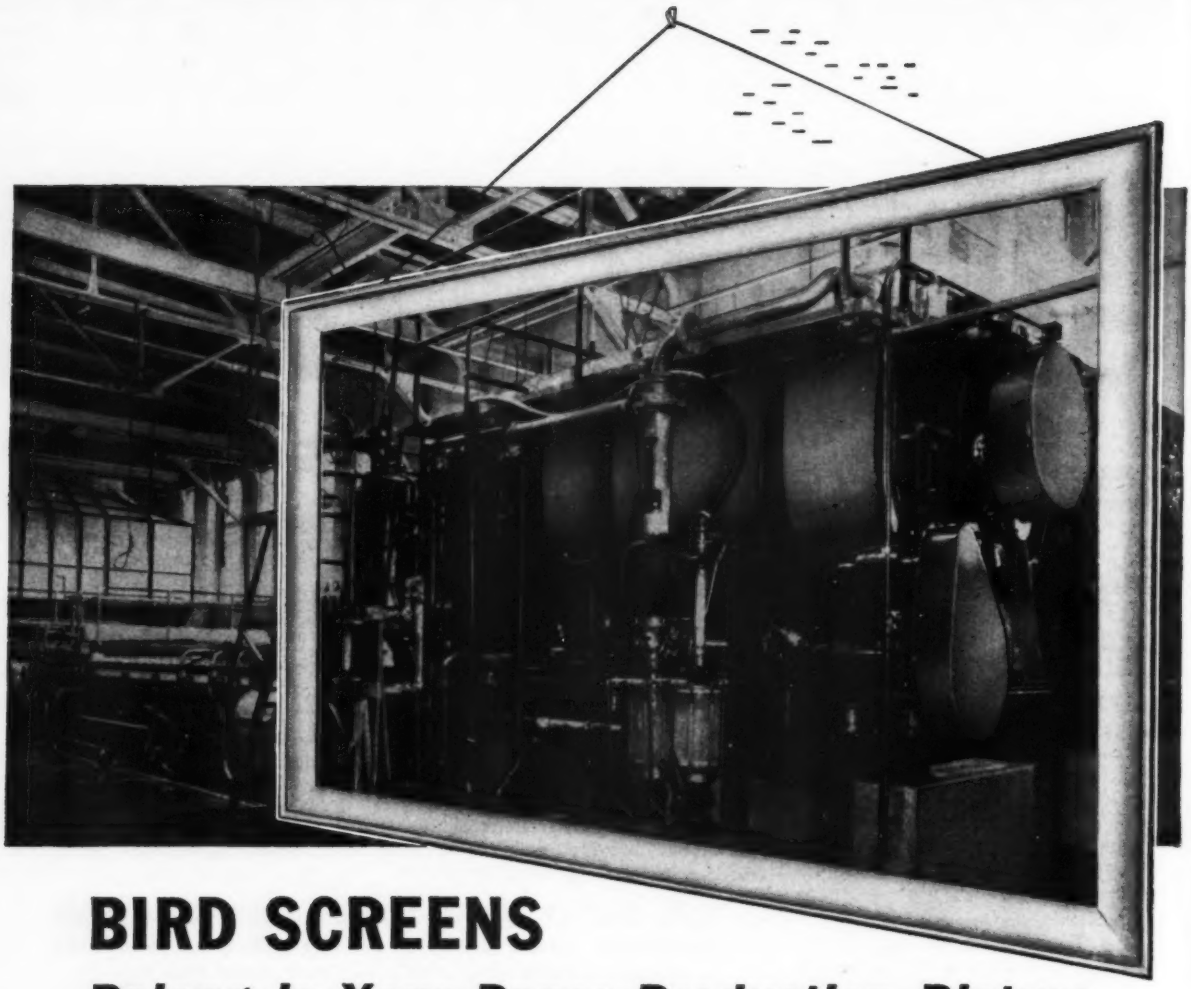

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stocks to help newspapers in Europe, South America, and Asia, according to Congressman Harmar D. Denny Jr. of Pittsburgh. A member of the House Committe on Interstate and Foreign Commerce, Rep. Denny made the statement at the recent annual meeting of the Pennsylvania Newspaper Publishers' Association, held in Harrisburg.

Some of these foreign governments have adequate pulp sources available to tide them over the shortage if they would stop using it to manufacture other paper products in which there is greater profit, the speaker said. During the first eight months of this year 30,000 tons of newsprint have been allocated to foreign nations.

Countries which are either above their pre-war production average or approaching it include Great Britain, France, Italy, Finland, Norway, and Sweden. West Germany is ahead of its pre-war average by some 20,000 tons.

If the United States cuts down on exports, these nations will be forced to manufacture more sulphur and produce more newsprint instead of getting it from North America at a much lower price. The current price in the U. S. is approximately $116.50 per ton, while in Europe the price runs as high as $400.

Canada is ready and willing to increase production, but to do it more sulphur has to be made available. This can be supplied only by cutting down on exports, which have resulted in the present 10 per cent cutback in certain U.S. publishers' commitments.

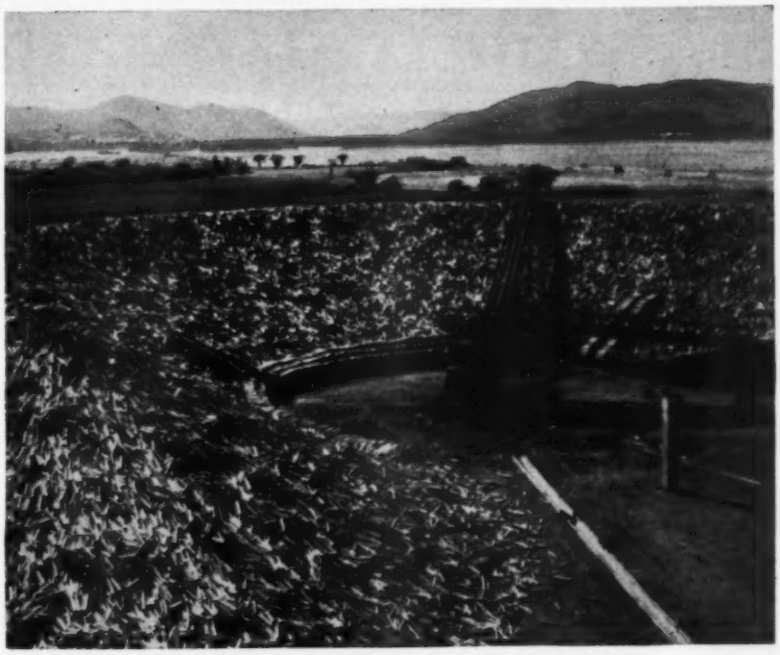
Nine-Month Newsprint Production 5.4% Above Last Year

Total North American production of newsprint during the month of September was 518,118 tons, according to figures released by the Newsprint Service Bureau. Production in Canada amounted to 431,082 tons and production in the United States 87,036 tons. For the first nine months of this year the total production was 4,938,789 tons, a 5.4 per cent increase over the similar period last year.

Canadian shipments in September were 427,738 tons, while those in the United States stood at 88,795. Shipments in September, 1950, were 570,974 tons. Production last September was 523,990. Stocks of newsprint at the end of the month at Canadian mills were 152,301 tons and at U. S. mills 8,432 tons, making a total of 160,733 tons, compared with 146,438 last year.

Bowater Newsprint Unit to Cost More than $50 Million

Bowater Paper Corp. Ltd's. projected Tennessee newsprint and unbleached sulphate mill, including woodlands, will cost in excess of $50,000,000. The annual capacity of the proposed mill will be 125,000 tons of newsprint and 50,000 tons of unbleached sulphate.



PULP LOGS at Restigouche Co. Ltd's. mill at Atholville, New Brunswick

Although the unit's entire output of newsprint will be sold in the United States, the amount of newsprint supplied from the company's main plant in Newfoundland for the U.S. market is not to be reduced.

Bowater has selected the Charleston-Calhoun area in Tennessee because it contains all the necessary factors for a newsprint development as well as adequate transportation by rail and water for the movement of the finished product. If the Defense Production Authority grants a certificate of necessity for the project, it will be financed in conjunction with American investors.

Fire Risk High in East and South

Lack of effective rainfall over an extended period has created a high fire danger in eastern and southern timberlands. Foresters in these regions expected a severe fire situation during fall months, due mainly to the thousands of hunters who will be in the forests during much of the period.

According to a report from the eastern regional offices of the United States Forest Service, precipitation during September and October was moderate to light over the greater part of the Atlantic seaboard. During September 144 fires burned 365 acres, making the total burn during 1951 in the 14 northeastern states 110,134 acres swept by 8,023 fires. Most of the September fires were reported in states in the southern half of the region, where conditions are driest. During the month only four fires were reported on national forests, two on the George Washington and two on the Monongahela forests.

Excessive moisture has greatly relieved fire danger in the North Central Region. U.S.F.S. offices at Milwaukee report that normally the area can expect a short but severe fall season. However, in both the northern and southern portions, no more serious fires are expected unless a dry period should occur—especially during hunting season. Since the middle of September only three small spot fires have been reported on national forests.

All-Canada Loss Slight

Canada generally did not suffer a severe fire season, as summer rains in most parts of the country eased the task of fire prevention. In contrast, the western coastal region suffered one of the worst years in history, and certainly the worst since the devastating year of 1938.

Great damage was done to the forests in actual timber burned, but the whole economy felt the pinch, with 12,000 loggers idle and 1,600 camps closed down. The ban lasted for almost two solid months, causing a loss in revenue of almost $50 million. Not only the forest industries, but also the fishing and mining industries were affected by the closure.

Prairie provinces announced an easy year, with tourist cooperation and intermittent rains simplifying the work of prevention. Damage was below normal.

All other regions reported less losses

than in 1950. The Maritimes had 60 per cent less damage due to heavy summer rains. Newfoundland, which had a fairly long dry spell, reduced losses only 15 per cent, Ontario cut reported damage by 13 per cent, and Quebec reported that damage was considerably less than usual.

Hope to Save Threatened Timber by Giant DDT Aerial Operation

More than 250 square miles of New Brunswick timber will be sprayed with DDT next year in an effort to save an estimated 2,000,000 cords of pulpwood from the ravages of the spruce budworm. The operation, to be staged near Dalhousie, will be sponsored jointly by Canadian provincial and federal governments and New Brunswick International Paper Co.

Mature timber threatened by the insect would supply the paper company's mill at Dalhousie for approximately seven years. The firm's annual capacity is currently about 250,000 tons of newsprint.

The financial value of the threatened tract makes the attempt worthwhile, since the Province of New Brunswick stands to lose $8,000,000 in stumpage fees alone if the forest is ruined by the budworm. Total value to the people of the province in salaries and other income accruing from the conversion of wood into newsprint and other papers has been estimated at upwards of $100,000,000.

The entire operation will have to be carried out during the short space of approximately three weeks, while the insect is in a certain stage of its development. It is not expected by entomologists that the pest will be entirely eradicated, but they hope that it will be possible to prolong the life of the trees for the period during which they can be harvested.

The cost of the project is expected to run into the hundreds of thousands of dollars. The federal government will assign some of its top technical men to the operation. New Brunswick International has appointed Byron W. Flieger, its forestry education director, to work with government officials on all phases of the problem.

Sulphur Long-Range Outlook Good; Immediate Shortage Curtailing Production

Although the long-range outlook for easing the sulphur shortage is favorable, current production is unable to meet current demand, and the United States will inevitably face a severe crisis in coming months. Minimum requirements for the fourth quarter are expected to exceed production by 100,000 long tons.

New allocations of American sulphur to 17 foreign nations were announced in Washington, D.C., recently as the government prepared to order a 10 per cent slash in domestic consumption. Foreign allocation of 240,000 tons for the fourth quarter raises the total of such allocations for the year to 970,000 tons. According to a spokesman for Freeport Sulphur Co., New York, N.Y., stockpiles of the strategic element have declined from a prewar peak of two years' supply to a present low of only six months' supply.

Efforts on the part of private industry and governments throughout the free world promise an eventual supply of sulphur equal to the demand. New sources are being tapped, recovery plants built, and other units planned. However, the effect of such expansion will not be felt for several years.

Increased Allocations for U. S.

Nearly 75 per cent of the available world sulphur was allocated recently to the United States in a second round of allocations announced in Washington, D.C., by the 28-nation International Raw Materials Conference. The U. S. was awarded 1,098,500 tons, 48,000 tons more than it received in the first three-month allocation period. The remaining 367,318 tons were divided among 34 other nations and areas.

Great Britain was assigned the second largest amount—102,300 tons, which is 4,000 tons less than it received previously. Italy was awarded 36,000 tons, France 29,600 tons, and Australia 21,600. Although the Conference can only recommend that a government share its vital materials in the portions it dictates, its recommendations are essentially mandatory. The U. S., for example, must share its sulphur and newsprint with foreign consumers if it expects other nations to share their copper, rubber, and tin with this country.

Newsprint Not Affected: DPA

New cuts in sulphur consumption will not affect newsprint producers in the U. S. and Canada, according to a spokesman for the Defense Production Authority. Newsprint mills in both countries will continue to get the same amount of the mineral as they used last year. However, newsprint producers have been seeking increased allocations of sulphur because they are required to supply larger quantities of their output to foreign consumers.

It has been suggested by a Congressional committee that the United States government should "lean over backward" to get more sulphur to Canadian newsprint manufacturers. The subcommittee, making a continuing study of the newsprint situation, recently made an on-the-spot survey of Canadian production. In addition, the group is said to be considering plans for increasing U. S. production from Alaska and the South, and has also been attempting to expedite the actions of mobilization authorities in giving tax benefits and other help to new newsprint facilities.

NPA Considers Temporary Solutions

Although no decision has been reached by NPA on methods of alleviating the shortage, the following suggestions have been made as temporary solutions:

1. Restricting most sulphur users to less than their present permitted rate of 100 per cent of their 1950 use.

2. Restricting sulphur consumer inventories to a 25-day supply. This reduction from the three-month inventory now permitted would free an estimated 100,000 tons during the next few months.

3. Recovery and production of sulphur by the companies that use it. Firms would be permitted to use this captive sulphur up to a certain limit, in addition to the amounts they are already permitted to use.

In announcing the plans under consideration, NPA described the present picture as follows: Approximately 1,100,000 long tons of sulphur will be used in the U. S. during the fourth quarter if the present rate of consumption continues. Canada, operating under the same use limitations, will consume about 81,500 tons. Exports are expected to total 257,000 tons. The sum of all these various uses would be 1,438,500 tons. Production for the last quarter, however, is estimated at 1,338,500 tons, leaving a deficit of 100,000 tons.

DPA Cuts in Specific Uses

Meanwhile DPA has announced further cuts in the use of sulphur to produce sulphuric acid and carbon bisulphide, as well as cuts in specified end uses of the latter two derivatives. Manufacturers using the chemicals will be restricted to 90 per cent of their 1950 use, except those making sulphuric acid for important or essential programs like steel and non-ferrous metal production, synthetic rubber, petroleum, and military explosives.

U. S. Leads in Expansion

Shell Chemical Corp. recently announced plans for adding to its Houston,

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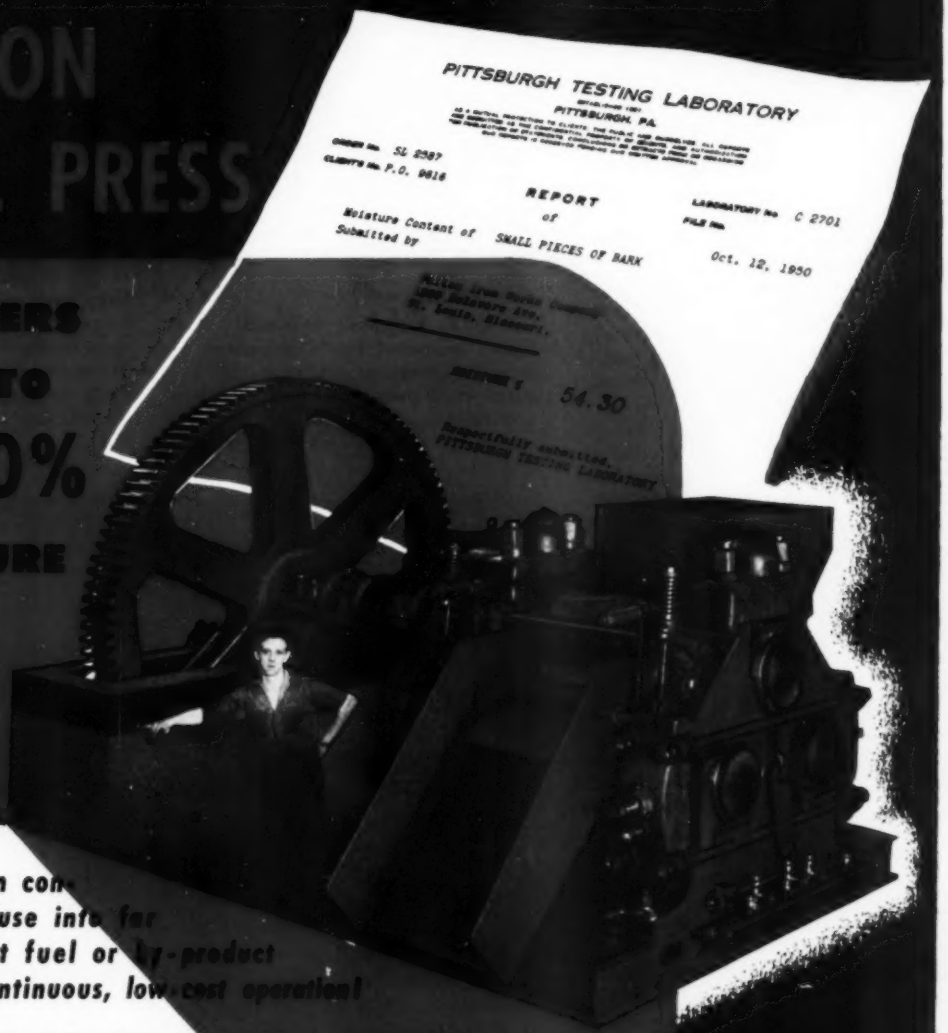

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Texas, operations a unit for recovering sulphur from waste refinery gases. Production is to be sold for conversion to sulphuric acid. The new unit, certified by the government as a necessary defense project, is expected to be in operation by the middle of 1952. In the recovery process, waste refinery gases, containing hydrogen sulphide, carbon dioxide and a small percentage of light hydro-carbons, will be burned and catalytically converted to sulphur at an annual rate in excess of 13,000 tons.

Stanolind Oil & Gas Co. has revealed plans for the construction of a recovery unit at its Slaughter gasoline plant near Sundown, Texas. Expected to be in operation by March of next year, the installation will recover about 40 long tons of elemental sulphur daily from 8,500,000 cubic feet of acid gas.

Brown Co., Berlin, N. H., has announced that it has developed a method of recovering sulphur from copper mine waste ore. The firm is building a $500,000 plant to process waste ore from the Vermont Copper Co. mine at Stratford, N. H. This will convert about 27,000 tons of waste ore a year into the equivalent of 9,000 tons of sulphur, about 50 per cent of the company's needs.

Gulf Oil Corp. has announced plans to build a sulphur recovery unit at its Waddell natural gas plant in Crane County, Texas. The installation will have a production capacity of 20 tons daily. Construction is expected to begin in December, with operation scheduled for February. Sulphur will be obtained from hydrogen sulphide, removed as a waste at the natural gas plant.

Canada

Canadian Industries Ltd. of Montreal, is constructing a liquid sulphur dioxide plant at Copper Cliff, Ont. When completed next fall, the plant will have an initial capacity of more than 90,000 tons a year. The unit will produce the sulphur dioxide from gases given off by the giant smelter operated by International Nickel Co. of Canada, Ltd.

Chile

Anglo-Lautaro Nitrate Co., a newly organized corporation, plans to devote its attention to the construction of six new solar-evaporation ponds, which have been blocked off at Maria Elena and which will process solutions from Pedro de Valdivia as well as Maria Elena. An extensive program of mechanization of the port facilities at Iquique is also a company project.

Mexico

Mexico will ship 2,500 tons of sulphur to Canada this year for distribution to paper mills. There will be a number of smaller shipments to England, Sweden, Finland, and Brazil. The Department of National Economy has stated that Mexico's sulphur shipments to Canada have assured the Republic of an adequate newsprint supply from Canadian mills.

Canada will receive 2,000 tons from the Poza Rica processing plant of Petroleos Mexicanos, the Mexican Government oil administration, and 500 tons from the deposit at Huascaman in the state of San Luis Potosi.

Bolivia

The Banco Minero plans to work sulphur deposits in the region near the Chilean border. These mines have been exploited by small private operators.

Great Britain

United Kingdom Sulphuric Acid Corp., sponsored by 11 important industrial consumers, plans to build a plant at Widnes, Lancashire, which is scheduled to attain an annual production rate of 150,000 long tons of 100 per cent acid within five years. Anhydrite will be used as the raw material, because of its relatively low cost and ready availability.

Italy

Several individual Sicilian sulphur mines are planning extensive modernization. A flotation plant is being installed at the Cozzo Disi mines near Campofranco, and another is being added at the Valsalso mine.

Turkey

With annual production averaging 3,000 tons since 1943, and with a 1950 output of 5,800 tons, Eti Bank, a state enterprise, will install a beneficiation process that would triple output and reduce production costs about 50 per cent. If the proposed plant is in operation by 1953, production will be stepped up to 14,000 tons of 95 per cent sulphur a year.

$200 SCHOLARSHIP CHECKS are awarded by E. E. Ludwig, chairman of Western Michigan College pulp and paper technology advisory committee, to (L. to R.) Maurice H. Metzelaars, Constantine, Mich.; William J. Fondow, Appleton, Wis., and Leonard J. Timmer, Kalamazoo.

Western Michigan College Expands Pulp and Paper Curriculum

Kalamazoo Valley paper mills have joined in a project to augment the courses offered by the Pulp and Paper Technology Department at Western Michigan College, Kalamazoo. Six courses in the curriculum are being taught by experts from the mills' technical departments.

L. Paul Newton of Kalamazoo River Improvement Co. is serving as assistant professor of industrial chemistry; Thomas E. Flanagan of Kalamazoo Vegetable Parchment Co. is an instructor in pulp testing; a course in fibre microscopy is under the direction of Charles E. Gardner, assistant superintendent of Lee Paper Co., Vicksburg, Mich.; Harold M. Hoogsteen of Sutherland Paper Co. is in charge of a course in the chemistry and technology of plastics; bleaching, pulp purification and deinking is under the direction of John R. Dam of Allied Paper Mills.

Awards and Scholarships Announced

Rudolph K. Germanson of KVP, successor to the late Ralph A. Hayward as chairman of the Western Michigan paper scholarship committee, recently announced eight awards and scholarships for the current academic year and the establishment of an endowment fund for additional future scholarships.

Achievement awards ranging from $100 to $200 have been established as follows: TAPPI Junior Student Award, sponsored by the Kalamazoo Valley Section of TAPPI; the Paper and Twine Association Sophomore Student Award and the Paper and Twine Association Salesmanship Award, both sponsored by the Paper and Twine Association; the Fred C. Boyce Junior Student Award,

Saves 79% on fuel

IF YOU are still paying "extortion" money to over-age steam cranes, you will be interested in the matter of fuel costs . . . just one item of operating expense. For one crane owner, the fuel bill was cut from $6.60 a day to about $1.40 a day by replacement of a steam crane with a modern American Locomotive Crane.

In addition to this 79% saving, higher speed enabled the new machine to handle a much larger tonnage on the job. And three stops each day for coal and water were completely eliminated.

What saving can *you* expect? That depends on the job, and the type of American Locomotive Crane you select. Why not mail the coupon below, and then let us discuss your operations specifically.

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AMERICAN LOCOMOTIVE CRANES

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Reduces over-size fiber bundles
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removes tramp metal

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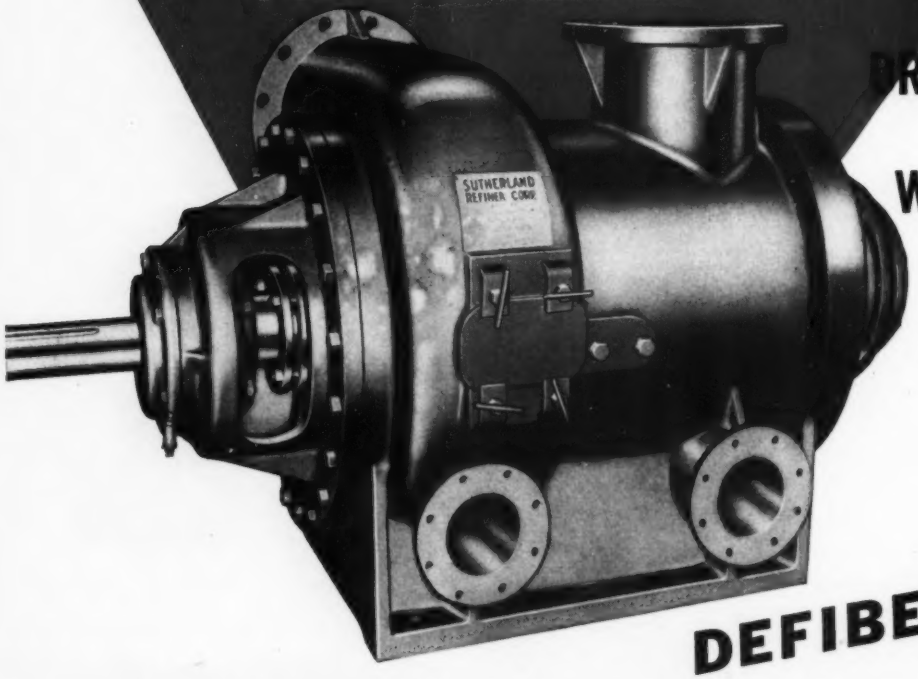

DEFIBERING

Here's a rugged machine that combines selective defibering action with efficient tramp metal removal, and does both jobs with a minimum of power. The Breaker Trap reduces over-size fiber bundles, but leaves large dirt particles untouched, so they can be rejected by conventional screening methods. It can be used with excellent results on brown stock as a pre-knotter.

If you're interested in defibering chemical and semi-chemical pulps or waste papers, you'll like to know what this new machine offers you.

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Write for descriptive folder today.

Patent pending

Breaker Trap

SUTHERLAND REFINER CORPORATION

TRENTON 8, N. J.

sponsored by the Superintendents Association; two scholarships of $200 from the Paper and Twine Association, and from one to four $200 scholarships in the Norman Bardeen Memorial.

Freshman recipients of the Paper and Twine Association Scholarships are Maurice H. Metzelaars, Constantine, Mich.; William J. Fondow, Appleton, Wis., and Leonard J. Timmer, Kalamazoo. Stanley S. Makowski of Vicksburg, Mich., has been granted the Norman Bardeen Memorial Scholarship for 1951-52. The TAPPI Junior Student Award goes to Arne H. Anderson. The Fred C. Boyce Award is to be announced at the close of the academic year.

Students Form Club

A club for future papermakers was organized October 12 at Western Michigan by 41 students studying pulp and paper technology. The group chose the name "Ts-ai-Lun" to honor the first papermaker recorded in history.

Maine Foundation Progress Reviewed

Progress of the Pulp and Paper Foundation established less than two years ago at the University of Maine, Orono, was reviewed recently by university and industry members at their second annual meeting. At the same time plans for next year were made.

The scholarship committee, it was reported, awarded $1,000 grants to six qualified students during the 1950-51 academic year. To aid other deserving students in the field the Foundation provided loans from the Loan Fund. The curriculum committee assisted with the establishment and expansion of the five-year program in pulp and paper. At least two years of summer work in the mills are required. In addition, an experienced lecturer in technology was added to the faculty.

The research committee suggested appropriate subjects for continued work. Among topics discussed were stream improvement, paper testing methods, effects of drying conditions on physical characteristics of paper, utilization of bark, and the measurement of the value of beater additives.

A new publicity committee, headed by T. W. Prescott, assistant advertising manager of Scott Paper Co., was set up. Membership committees were expanded. The finance committee reported excellent cooperation from industry.

The Foundation announced October 25 that West Virginia Pulp & Paper Co. has subscribed as a scholarship underwriter. In accepting the gift, J. L. Ober, executive committee chairman and vice president of Scott Paper Co., declared that the cooperation and support of members of the pulp and paper and allied industries have been most encouraging, with increasing contributions being received all the time.

Nine Awarded Scholarships

Nine students enrolled in the chemical engineering department of the College of Technology were recently awarded scholarship grants for the current school year by the Foundation. Dean Ashley S. Campbell of the College is chairman of the scholarship committee.

Recipients of the scholarships for this semester are James E. Ayer, Bangor; Frank A. Butler, Verona, N.J.; Dwight D. Frye, Bucksport; Donald R. MacKinnon, Orono; John M. McClure, Glendale, Cal.; Robert E. Perry, South Freeport; William E. Pomeroy, Bath; Roy P. Webber II, Portland, and Robert N. Zabe, Bangor.

Kalamazoo Mills Ordered to Abate Pollution

What amounts to a "blanket" order to the 15 mills of the Kalamazoo River Valley to abate pollution of the river by September 1, 1955, has been issued by the Michigan state Water Resources Commission.

At the same time the WRC adopted final pollution abatement orders requiring the cities of Parchment, Plainwell and Otsego to end pollution by June 1, 1955. The city of Kalamazoo is already under orders to have its sewage treatment plant in operation by June of 1953.

In this last mentioned order the WRC went counter to recommendations of the Kalamazoo River Waste Study Committee set up by Mayor Paul H. Todd. That committee, after an exhaustive study, had asked that the paper mills be considered on an individual basis.

The WRC order came after years of study by the state body, many conferences between state authorities and paper mill executives, and after a deinking waste water treatment had been discovered and a commercial plant erected.

This commercial plant resulted from studies started by the National Council for Stream Improvement in cooperation with mills of the valley. These mills, six of them, later formed the Kalamazoo River Improvement Co., when the initial studies showed promise and it became likely a feasible clarification method for treating deinking waste water would be found. Operation of the plant removes, by bacterial action, the chemical matter in the deinking waste water, which depletes the river water's oxygen supply when discharged untreated.

The fact that the process, while creating still another problem—a sludge residue, does make available to the mills a means of rendering their water discharge into the river comparatively harmless is believed to have been the final factor in bringing about the WRC order. Also, conservation clubs, active in the fight to prevent pollution of the river for many years, intensified their drive against industrial pollution of the state's streams in the last few years.

In its order setting the compliance dates for the mills of the valley, the WRC set forth the following conditions, identical for all mills: "As an interim objective and except as compliance may be delayed by denial to the applicant of the necessary equipment of materials by the controlling federal agency, all freely-settleable solids in all wastes from deinking pulping operations shall be kept out of the waters of the state.

"Except as compliance may be delayed by denial of equipment or materials, all paper processing wastes other than those from deinking pulping operations, which are separately discharged to waters of the state, shall be restricted to not more than ten (10) pounds of suspended solids per ton of product."

September Compromise

In September the WRC made a "compromise" offer to the mills in the valley. It offered to consider alternate proposals to the blanket order then before commission calling for pollution abatement by June 1, 1954. The mill were given until October 15 to submit their proposals in writing.

Milton P. Adams, executive secretary of the WRC, warned mill managements that "a commitment containing a firm date for abatement at one or two or more mills under one management, or partial abatement by a single mill management, with only progress reports thereafter as to the remainder of work involved is not going to be acceptable."

When the alternate proposals were considered, Allied Paper Mills were revealed by the WRC as the only concern that had submitted a commitment that could be incorporated into the commission's order. That commitment called for plans for pollution abatement by March 1, 1952, and abatement by October 1, 1953, for its Monarch Mill and plans May 1, 1954, and abatement by September 1, 1955, for its King Mill.

However, the WRC order calls for St. Regis Paper Co., Rex Paper Co., Michigan Paper Co., and Kalamazoo Paper Co. to have construction plans approved by April 1, 1953, and to abate pollution by June 1, 1954. The same dates are set for Hawthorne Paper Co.; National

Gypsum Co.; Sutherland Paper Co., Divs. 1, 4, and 7; Kalamazoo Vegetable Parchment Co., Mills 1 and 2; MacSim-Bar Paper Co., Otsego, and Otsego Paper Co.

These latter mentioned mills are given orders also that, barring inability to get materials, "all paper processing wastes discharged directly into the waters of the state shall be so treated by coagulation and sedimentation or other equivalent means as to produce an effluent containing not more than ten (10) pounds of suspended solids per ton of product."

The order against Otsego Falls Paper Co. was made to apply only to the mill's paper production wastes. Mr. Adams reminded the commission that the company "must do something about its pulp process liquors, and I expect action within the next year, perhaps getting into court for a showdown because it contributes the largest single loading on the river."

R. J. Suess, resident manager of Otsego Falls Paper Co., assured the WRC that his mill management has every intention of working toward a solution of its own river pollution problem. He pointed out that there is no known method of treating the waste from this particular type of mill, which uses raw wood for pulp. The mill's president and general manager, D. H. Greene, have been conferring with the Institute of Paper Chemistry at Appleton, Wis.

A commendation was voted for one mill, Michigan Paper Co., Plainwell, in which the board decided "to acknowledge an October 10 letter from Michigan Paper Co., which, after consideration, does not lend itself to incorporation in an order and also to recognize management's willingness to comply with our commission's objectives."

When the order was issued, managements of the Valley's mills generally refrained from critical comments. However, Fred C. Goodwill, resident manager of the Bryant Division, St. Regis Paper Co., said he has been advised of "no home office change in the feeling as expressed at the time the proposed order was first mentioned."

He was referring to his statement then that the proposed abatement order might force St. Regis to close its Kalamazoo bookpaper mill. Mr. Goodwill also called critical attention to a comment made by Leo Hoffman, member of an Allegan pollution abatement committee, at a meeting of the WRC in Holland, Mich., late in August. Mr. Hoffman was reported to have stated then that, if it became a question of whether "we are going to have a decent river, or one or two or three mills" the river was most important and that "other more desirable" industries should be brought in to replace the mills.

Dwight Stocker, president of Michigan Paper Co. said, "We are planning to go ahead as soon as we can, tightening up our internal mill operations and proceding with the treatment of deinking wastes so we will be ready at the time the order is effective, providing we can get the necessary materials."

Alfred Southon, president of Kalamazoo Vegetable Parchment Co., said his conecrn had been "working toward that (pollution abatement) end for a long time." He said the problem was a less serious one for KVP than for some other mills, then added "We are all agreed as citizens that something does have to be done. But there seems to be a question about whether some mills can ever do it, or find a way to do it."

James A. Wise, vice president of Kalamazoo Paper Co., said his company "hopes to proceed with the necessary installation for one of our three deinking plants as soon as possible so as to obtain the necessary experience to assist us in meeting the date of the final order."

Sulphite Waste Research at Three Midwest Colleges

Research will be conducted for at least the next year at three Midwest universities in the constant attempt to discover more effective large-scale uses for spent sulphite liquor. This was announced recently by the Sulphite Pulp Manufacturers' League, Appleton, Wis., which granted increased funds to Michigan State College, and the Universities of Wisconsin and Minnesota. Purpose of the research, sponsored by 14 mills through the League, is to reduce sulphite pollution in Wisconsin streams.

At the Wisconsin and Minnesota schools studies are being carried out on one subject. Wisconsin agricultural specialists are studying the method by which the vitamins and growth factors in torula yeast as used in fortified poultry feeds affect the development and weight of the birds. Minnesota poultry professors are working on a parallel problem, but are confining their research to the unidentified and unknown growth factors in this feed supplement. The yeast is a product of the experimental sulphite liquor treatment plant at Rhinelander Paper Co., Rhinelander.

At Michigan State a League fellowship in the agricultural school is investigating the usefulness of torula yeast in feeding swine. The fellowship has been operating for one year, and has recently been renewed for another.

Technical Directors Meet

Technical directors of Wisconsin's sulphite pulp mills met at Rhinelander September 28 to check on three months' research on sulphite liquor and to make future plans. Those in attendance comprised the technical committee of the Manufacturers' League, and they meet every three months for a progress report. The annual research budget exceeds $150,000. Chairman of the committee is Henry Rothchild of Kimberly-Clark Corp., Neenah; N. L. Malcove, Northern Paper Mills, Green Bay, is vice chairman.

Foreign Visitors Inspect U. S. Paper Industry

Two groups of European paper experts recently visited paper manufacturing plants in the United States. Under the auspices of the Economic Cooperation Administration, productivity teams from Ireland and the Netherlands toured many installations with the purpose of increasing European production, economizing the use of critical materials, and studying U.S. distribution and marketing techniques.

The Dutch Paper and Board Packaging Mission visited Lily-Tulip Cup Corp's. College Point (L.I., N.Y.) plant; Gaylord Container Corp. and Bemis Bros. Bag Co., St. Louis; Kraft Foods, Chicago; Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.; Hinde & Dauch Paper Co., Boston, and other plants throughout the eastern United States.

Among the factories toured by the Irish Mission was that of Continental Paper Co., Ridgefield Park, N.J., and American Writing Paper Corp., Holyoke, Mass. The team was made up of representatives of all phases of the paper industry: management, engineering, chemistry, technicians, specialists, and mill workers.

U. S. Experts in Europe

While foreign visitors are touring American plants, three U.S. packaging experts are in Europe to demonstrate how to save materials, production costs, and manpower through modern methods. The experts conducted a series of demonstration-discussions recently with industrialists of nine western European nations.

Those sent to the continent under the sponsorship of ECA were Lee R. Forker, assistant secretary and general purchasing agent of Quaker State Oil Refining Corp., Oil City, Pa.; Edwin W. Ely, chief of the Commodity Standards Div. of the U.S. Department of Commerce, Washington, D.C., and William C. Reiser, London director of Loewy Associates and formerly of New York, N.Y.

Among the purposes of the mission are the substitution of more available or cheaper materials for scarce materials, the standardization of industrial packaging, and the introduction of new methods. Nations visited by the men included France, Denmark, Norway, Germany, Austria, Italy, Benelux.

Keep your eye on the ball

An old duffer told us that.
He'd say, "If you're going to hit that ball,
you've got to know where it is — all the time."

And if you're going to stay in
business, you've got to know where your
basic raw materials are coming from.

Take chlorine, for instance.
No, we can't sell you any now.
Because our customers of record come first.
But we would like you to think about
becoming a customer of record yourself —
some time in the future.

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA
CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE
HYDROGEN • DRY ICE • SYNTHETIC DETERGENTS • GLYCOLS
CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE • PROPYLENE
DICHLORIDE • AROMATIC SULFONIC ACID DERIVATIVES
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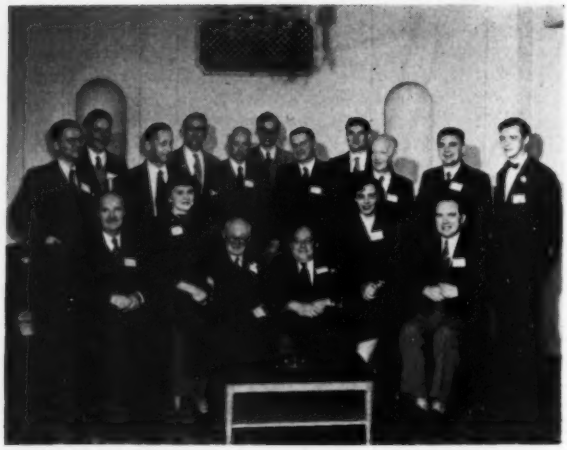
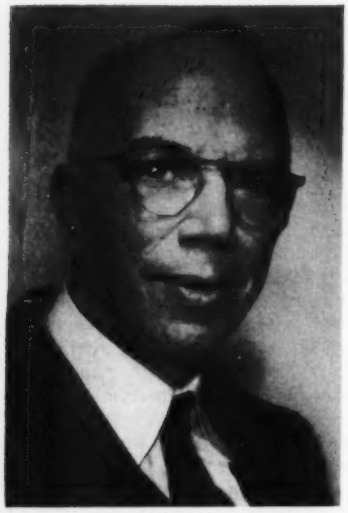
GOOD FELLOWSHIP characterized the annual Pulp and Paper Smoker, which featured entertainment and refreshments



ECA GUESTS attending the luncheon represented safety experts from Germany, the Netherlands, Austria, and Sweden



HARLEY B. GOODRICH, Strathmore Paper Co., West Springfield, Mass., was elected 1951-52 chairman

Paper Mill Safety

Sharing ideas and ideals for safety was the purpose of the more than 150 paper industry representatives who attended the National Safety Congress held in Chicago October 8-12. The meeting, attended by an estimated 14,000 delegates from all industry, was sponsored by the National Safety Council in the interest of accident prevention in the home, at work, and at play.

With headquarters at the Stevens Hotel, the Pulp and Paper Section staged three technical sessions in addition to the annual luncheon attended by all section delegates. Speaker at the luncheon was Gunnar Hultman, managing director of the Swedish Pulp Employer's Federation. He addressed the group on the topic, "Safety Work in Sweden Now."

One of the highlights of the meeting was the yearly presentation of the Edward Benton Fritz Memorial Trophy, awarded by THE PAPER INDUSTRY for the best overall achievement record in the paper industry safety contest. Recipient of the 1950 award was the Williamsburg, Pa., plant of West Virginia Pulp & Paper Co. (see page 916).

Among officers elected to serve the Pulp and Paper Section during 1951-52 were: Chairman, H. B. Goodrich, maintenance and safety engineer, Strathmore Paper Co., West Springfield, Mass.; vice chairman and program chairman, A. E. Minor, safety supervisor, Ontario-Minnesota Pulp & Paper Co. Ltd., Kenora, Ont., Canada; secretary and membership chairman, Dallas E. Henry, safety coordinator, Southern Advance Bag & Paper Co., Hodge, La. The retiring chairman is C. L. R. Dougherty, assistant manager of industrial relations for Union Bag & Paper Corp., Savannah, Ga.

Grand Prize Award

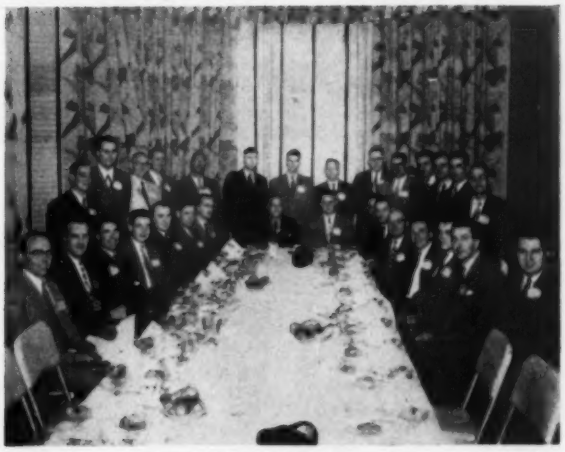
In awarding the grand prize in the safety contest to West Virginia Pulp & Paper's Williamsburg plant, A. Scott Dowd, chairman of the contest committee and president of Fritz Publications,

C. L. R. DOUGHERTY, Union Bag & Paper Co., Savannah, Ga., the retiring chairman

GEORGE W. HARPER, past chairman, presiding at the luncheon

E. J. GAYNER, Brunswick Pulp & Paper, at the opening session

LARGEST ATTENDANCE of all roundtable sessions was that of the paper manufacturing group. Harold S. Wilson of Liberty Mutual Insurance Co. presided; Lambert Louy, Container Corp. of America, was conference recorder



DELEGATION FROM KIMBERLY-CLARK gathers for annual safety meeting during the Congress. Seated at the head of the table are J. L. Sensenbrenner, assistant secretary-treasurer, and Al Johnson, company safety supervisor

Discussed at 38th NSC

declared that selecting a winner from among 270 paper and pulp mill contestants, 17 of which had perfect scores, was no easy task for the judging committee. Those who served on this committee were G. E. Sanford, formerly safety director for General Electric Co., Schenectady, N. Y.; H. F. Reinhard, consulting engineer, Union Carbide and Carbon Corp., New York, N. Y.; and Wesley H. Graff, supervisor of safety for United States Rubber Co., New York, N. Y.

"For 26 years it has been the privilege of THE PAPER INDUSTRY to award the major prize for safety achievement in the annual contests among pulp and paper mill members of the National Safety Council. Since the death of Edward Benton Fritz in 1939, founder of the publication and a pioneer in safety in pulp and paper mills of North America, this award has been presented in his honor.

Two years ago it was awarded to West Virginia Pulp & Paper Co. at Tyrone, Pa. And now another member of the Westvaco family in Pennsylvania has won the prize—the mill at Williamsburg."

At this point Mr. Dowd explained to the audience the absence of Mrs. Edward Benton Fritz, vice president and treasurer of Fritz Publications, Inc. Mrs. Fritz until a year ago was present at the Congress to present the Fritz trophy as a memorial to her husband. However, she was unable to be present and asked Mr. Dowd to extend her congratulations to the winner and good wishes for all safety workers. He then presented the trophy to representatives of the Williamsburg plant.

Some brief highlights of the company's record, and those of a few others, will be related for the encouragement they might offer.

In operation since 1905, the Williamsburg plant is a completely self-contained sulphate pulp and paper mill with a daily rated capacity of 75 tons of pulp and 80 tons of paper. In 1950 it produced a total of 24,442 tons of pulp and 28,237 tons of paper.

With an average of nearly 500 employees, this mill has retained an accident frequency rate of .00 for well over two calendar years. Safety conscious employees have achieved one goal after another, set up as targets by plant safety officials. As of March 16, 1951, with a then current record of 2,296,728 manhours without a lost-time accident, the plant had its sights set on the pulp and paper industry record of 3,343,598 manhours.

The total man-hours since the last injury in September 1949 up to the close of the National Safety Council Paper Industry Contest on December 31, 1950, was 689,349 hours, representing 470 days of operation. The contest judges gave this mill its honorable mention and third place in the election of the winner.

U.S. Gypsum Co. and Certain-Teed Corp., with perfect records, received honorable mention.

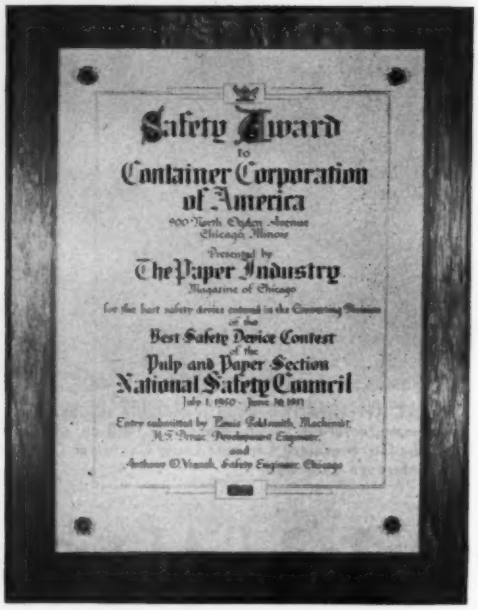
Complete operation at the United

GUNNAR HULTMAN, Swedish safety expert, addressing luncheon group

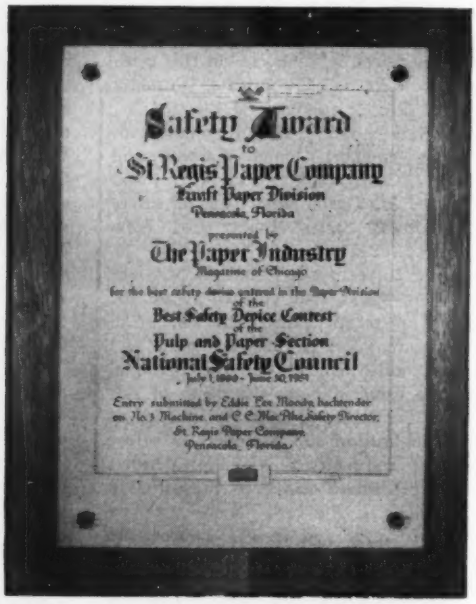
FRED O. SOUGHTON, LongLac Pulp & Paper, at technical session

R. W. GRAY, Union Bag & Paper, at second general meeting

THE PAPER INDUSTRY Best Safety Device Awards . . .



PROUD RECIPIENTS of the best safety device award in the converting division receive their certificate at the opening session. Representing Container Corp. of America's Ogden plant, Chicago, are Anthony O. Vranek (left), safety engineer, and Louis Goldsmith, machinist, who developed a feed roll guard as their entry. Presenting the award is A. Scott Dowd, contest committee chairman and president of Fritz Publications, Inc., Chicago



AUTOMATIC PAPER TAIL CUTTER development achieves for these representatives of St. Regis Paper Co., Pensacola, Fla., the best safety device award in the paper division. Photographed during the presentation as Mr. Dowd makes the award are C. C. MacPike, St. Regis safety director, (left), and Eddie Lee Moody, backtender on No. 3 machine, who was credited with the new device which is an automatic knife for angling across the sheet

States Gypsum Co. plant at Oakmont, Pa., covers the production of kraft paper, and conversion of same into multi-wall plaster and lime bags. The operation employs 180 people.

A total of 360,032 man-hours were worked in 1950 with an accident frequency rate of zero. What's more, 17 consecutive months were worked without an injury requiring a doctor's care.

And, during the 26 months preceding the closing date of this 1950 Paper Industry Safety Contest, United States Gypsum Oakmont employees established a record of nearly three-quarter million man-hours worked without a reportable injury.

During the year 1950 the York, Pa., plant of Certain-Teed Products Corp. shared first place in its division of the contest. It won the contest in the City of York for its safety performance, competing against industries of all kinds and, finally, captured for the third time in six years first place in the corporation contest and gained permanent possession of the Corporation Trophy.

SULPHITE PULP MANUFACTURING discussions held the interest of participants during the annual roundtable meeting. Harold R. Alley, National Safety Council staff representative, is to the extreme left in the last row

SAFETY METHODS in insulation manufacture came under the careful scrutiny of these roundtable participants. Amos S. Keen of Armstrong Cork Co. (center) was chairman. Others at the head table are Gordon Allen (left) and B. J. Lee, both of Wood Conversion Co.

Best Safety Device Awards

Two new presentations were made in conjunction with the best overall safety award—these for the best safety devices in the pulp and paper industry. The new contest was introduced to the section and sponsored by the National Safety Council in June 1950. THE PAPER INDUSTRY offered a Certificate Award to the winner in each division.

Mr. Dowd announced the winners. First in the paper division was St. Regis Paper Co., Kraft Paper Div., Pensacola, Fla. The device was an automatic tail cutter—a knife mechanically operated for cutting the tail on a sheet of paper. After the tail has been transferred to the new reel, the knife automatically angles across the sheet. The entry was submitted by Eddie Lee Moody, backtended on No. 3 machine, and C. C. MacPike, safety director.

Winner in the converting division was Container Corp. of America, 900 Ogden Ave., Chicago, for a feed roll guard, which was designed to make it impossible for a man to become caught in the nip of feed rolls and pulled into the press. The entry was submitted by Louis Goldsmith, machinist; H. F. Drnec, development engineer, and Anthony O. Vranek, safety engineer.

Honorable mention in the paper division went to Marinette Paper Co., Marinette, Wis., for developing machined ends of reel spools on the paper machine, entry submitted by E. T. Martenson, safety supervisor; and to Canadian International Paper Co., Montreal, for a safety hook for standard or extension ladders, entry submitted by J. H. Robinson, manager of industrial relations.

Honorable mention in the converting division went to Stone Container Corp., Chicago, for a wrap roll arm extension on corrugator pre-heater, entry submitted by Joseph M. Daley, chairman of the safety committee.

Happiness Through Safety

That a safe employee is a happy employee was emphasized by E. J. Gayner, president of Brunswick Pulp & Paper Co., Brunswick, Ga., as he addressed the opening general session of the pulp and paper group. Mr. Gayner told the delegates that, regardless of the safety expert's official title, it is his responsibility to preserve the life, limb, property, and happiness of workers and their families.

Prior to the address by Mr. Gayner, outgoing chairman C. L. R. Dougherty reviewed the progress of the section during the past year. He reported that the section now comprises 809 members, a gain of 17 during 1950-51. He pointed out, however, that only 425 members are active, and that the participation of all is necessary.

In speaking to the group the Brunswick president pointed out that the pulp and paper frequency rate in 1950 was 11.80; that this 11.80 figure ranked 23rd among the corresponding rates for 40 major industries, and that the severity rate of 1.05 in 1950 ranked 27th, as compared to 23rd in 1949.

Mr. Gayner listed seven fundamentals for an effective, efficient and well-rounded safety program: sincere management interest, neatness in plant and with equipment, equal footing for safety with production and quality, supervision capable of and interested in training and directing people in the efficient and effective production of quality products with safety, communication—the little man is doing his job and deserves to be kept informed, provision of trained personnel and adequate facilities for the medical program, and provision of capable leadership for the safety program.

Individuals responsible for safety programs must be men of action, have the will to succeed, use common sense, be inquisitive, be enthusiastic, be confident, have faith in themselves and the employees, set their sights high, be cheerful, and constantly seek new opportunity.

Technical Session Opens

The first technical session was opened on the second day of the convention by Harley B. Goodrich, new section chairman. Four speakers addressed the entire group on various safety methods employed by their firms.

Safety and Quality

Declaring that top management must be sold on the advantages of a safety program if that program is to be a success, Fred O. Soughton, service and safety supervisor for LongLac Pulp & Paper Co., Terrace Bay, Que., Canada, said that quality, production, and safety must all be considered equal. Mr. Soughton's topic was, "Quality Production with Safety—a Proven Reality."

Safety must be built into a mill, with the program calling first for the elimination of mechanical hazards and then for the individual cooperation of each employee through his supervisor. Disciplinary action should be held imperative to success. Cooperation is the vital phase of a successful safety program; the safety director cannot possibly accomplish his goal alone. At LongLac each new worker is given the background of the company and its safety program; advertising principles are applied to make each man aware of the importance of the program; daily and weekly safety messages go to all supervisors; workers on their way to their jobs must pass 10 different signs, posters, and record graphs reminding them of the program, and committees are constantly at work in an effort to bring new methods into play for better safety.

8 WAYS that helped cut Accident Frequency 97%+

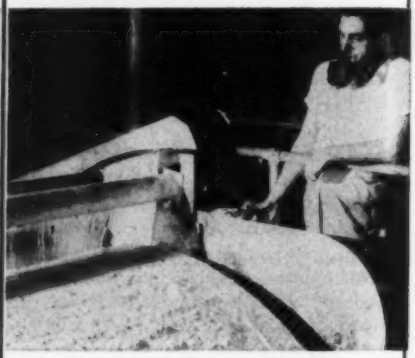
for WEST VIRGINIA PULP and PAPER CO.
Tyrone Mill

Explosive gas concentrations are detected with an M.S.A. Explosimeter before welding crews move in.

Potential carbon monoxide danger zones are probed regularly with the M.S.A. Carbon Monoxide Tester.

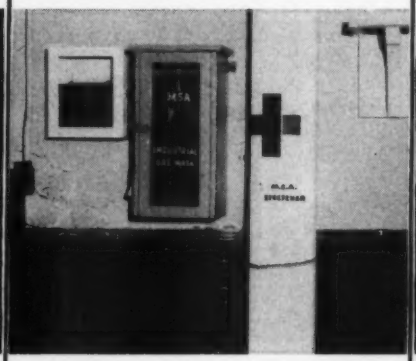
Where chlorine gas concentrations are present, workers are safeguarded with M.S.A. chlorine gas masks.

Harmful dusts, present during lime kiln operations, are combated with M.S.A. "Comfo" Respirators.

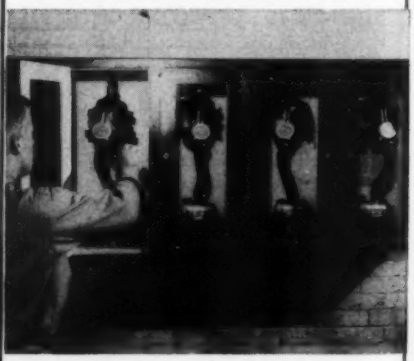


Light concentrations of chlorine gas and sulphur dioxide are trapped in the chemical cartridge of M.S.A. "Gasfoe" Respirators.

Smoke, fumes and gases are exhausted from enclosed areas with M.S.A.-Lamb Air Movers before workers enter.



Safety stations equipped with M.S.A. Industrial Gas Masks, First Aid Kits, and Stretchers are available for emergencies.



Emergency protection for chlorine plant workers is provided by M.S.A. Industrial Gas Masks in individual lockers.

GET DETAILED FACTS ON THIS SAFETY SUCCESS STORY!

Please send me at once:

- ☐ **Reprint PTJ-7651 describing in detail the West Virginia Pulp & Paper Company Safety Program.**
- ☐ **Complete M.S.A. Catalog of Industrial Safety Equipment.**
- ☐ **Have a trained M.S.A. Sales Engineer call.**

Tear out this coupon, attach it to your company letterhead, sign your name and title, and mail to:

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Braddock, Thomas & Meade Sts.
Pittsburgh 8, Pa.
DO IT NOW!

Faced in 1944 with the worst annual safety record in the company's history, officials of the Tyrone (Pa.) Mill of the West Virginia Pulp and Paper Company decided to do something about it.

An intensive and continuing educational program, stressing the proper use of safety equipment, protective devices, and instruments, was put into operation. Within a six year period, the company's accident frequency rate had dropped from a record breaking high of 63.39 to an award winning low of 1.88.

Dependable M.S.A. equipment played an important role. The illustrations above show several ways in which this equipment is used to protect employees on the job and in emergencies.

If you're not satisfied with your present safety record, and would like to do something about it, you'll find a lot of sound safety know-how, backed by a complete line of proved safety equipment, at your nearest M.S.A. Office. Write, wire, or phone—we'll be happy to discuss your problems with you.

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Slides Successful

Robert W. Gray, safety director for Union Bag & Paper Corp., Savannah, Ga., spoke on the topic, "Techniques of Accident Investigation and Effective Use of the Results." He described the method used by his firm, in which results of accident investigation are presented to supervisors through the use of slides. A reenactment of the accident is shown if possible and also a photograph of the steps taken to improve the situation. When good supervisors are in possession of full facts, they can and will correct any unsatisfactory condition relative to production, including that essential part of production, the conservation of the most indispensible tools they have—men.

Mr. Gray showed slides of various accidents which have occured in recent months at Union Bag & Paper Corp., following each with a shot of the remedial steps taken.

Paper Machine Fires

"Paper Machine Fires" was the topic discussed by G. W. Brahmst of the Associated Factory Mutual Fire Insurance Co., Boston, Mass. He reported the various causes of such fires as follows: hot bearings, 39 per cent; electrical, 18; friction (chokes, belts, etc.), 17; cutting and welding, 7; miscellaneous sparks, 4; static sparks, 3; hot steam pipes, 2; smoking 1, and unknown, 7.

Hot bearing fires occur principally in the older types of machines having grease or oil lubricated plain type bearings. Most blazes occur on the back side and are spread by oily fibres, paper dust, paper, rags, rope, and so on. There is no record of a fire on a new type machine having enclosed gears, anti-friction type bearings, and with oil supplied centrally.

Electrical fires are caused by failure to maintain equipment, particularly motors. Frequently the bearings are overlubricated, breaking down insulation. Welding and cutting fires are mostly due to carelessness.

Leading the suggested ways and means of preventing or holding fires to minimum damage was good housekeeping. Almost equally important are the installation of automatic sprinklers in hoods, ducts, economizers, and over the drive gears of the older type machines; ample hose connections; adequate portable type extinguishers; regular inspection and clean-up of each machine; modern lubricating systems; trained fire fighting crews, and a permit system for all welding operations.

"Operation Safety"

Hoyt H. Wheeland, superintendent of No. 2 mill, Mead Corp., Chillicothe, Ohio, warned that of all lost time accidents at Chillicothe during 1949 and 1950 only two resulted from unsafe conditions. The balance were the result of unsafe practices. The obvious cause of many accidents is failure to observe safe practices. But, on the other hand, there are other influences and pressures. There is little good to a safety program unless there is developed within the man a state of mind where there is always room for thought of caution. Many supervisors fail to discharge the responsibility of establishing an everlasting consciousness for the safe way.

In addition to the safety department, other departments must be responsible for a good safety program. Top executives must cooperate. The engineering department must be on the alert for new mechanical developments. The maintenance department must be responsible for regular inspections. The personnel department must be responsible for careful employee selection, careful medical inspections, rigid standards of physical condition, and preliminary preparation in safety fundamentals.

Swedish Expert Addresses Luncheon Meeting

Delegates attending the second annual pulp and paper luncheon heard an address, "Safety Work in Sweden Now," by Gunnar Hultman, managing director of the Swedish Pulp Employers' Federation, Stockholm. He described the organization in Sweden of industrial workers and their membership as a body in the Confederation of Swedish Trade Unions. Swedish employers are also organized extensively in the Swedish Employers' Confederation.

Negotiations for a new or prolonged agreement are taken up with one local union, after binding negotiations between the central branch organizations. A Labor Market Board was established in 1938, the functions of which include rulings as to dismissal and suspension of workers, limitations on resort to direct action in economic disputes, and the handling of conflicts involving vital public functions and services. By the basic agreement capital and labor have endeavored to safeguard freedom in the labor market and have aimed at abandoning methods that irritate while being without value to either party. It has been a common effort to keep the state aloof from decisions of the organizations concerning regulation of wages. There has not been any labor conflict in the pulp industry since 1932.

In May 1942 a subcommittee was elected to include members from both sides, which adopted regulations by which the institution of safety rules became generally obligatory. Safety representatives are required according to the number of workers in any individual plant. Safety representatives are assured there will be no hindrance from management. Representatives must be present at inspections and investigations. Compensation for wages lost is regulated. Safety committees at the various plants are re-required.

Since 1945 the Joint Safety Board has been checking on the application of safety rules and promoting safety measures. The Board was granted $100,000 by the government to launch a national program. The 1950 campaign was directed at the responsibilities of foremen in safety matters.

Among the activities of the Board are the arrangement of study programs for employees; distribution of safety films; publication of handbooks; establishment of first-aid courses, and the promotion of cooperation throughout industry.

In recent years the incidence of fatal or serious accidents has fallen. The number of reported accidents has increased out of proportion to the number of workers employed. However, the major rises have coincided with increases in sick pay. Under the national workmens' compensation act, an injured man gets benefits almost equal to his regular earnings. Therefore, there has been a substantial increase in accidents involving work absence. However, general interest in safety is intensified.

Safety work in the pulp industry involves comprehensive investigations of hygienic conditions and the incidence of occupational diseases, establishment of compulsory safety regulations, complete management cooperation, individual rules for the various mill departments, standards set for each member mill. The effect of all these voluntary moves has been to create ever improving safety.

Roundtable Discussions

Programs on the last two afternoons were devoted entirely to six roundtable discussions; three of these were held simultaneously on each day. In these informal, unrehearsed meetings, probably more problems are presented and questions answered than in any other kind of program. The various subjects discussed and the presiding officers were as follows:

Sulphite Pulp Manufacturing: Elmo B. Stevens, manager of personnel for Hollingsworth & Whitney Corp., Waterville, Maine; *Sulphate Pulp Manufacturing:* D. V. Hull, safety director, Mead Corp., Kingsport, Tenn.; *Paper Converting:* Robert W. Gray, safety director, Union Bag & Paper Corp., Savannah, Ga.; *Paper Manufacturing:* Harold S. Wilson, safety engineer, Liberty Mutual Insurance Co., New Orleans; *Pulpwood Logging:* John Currie, Woodlands Div., Great Lakes Paper Co. Ltd., Fort Williams, Ont., Canada, and *Insulation Products:* Amos S. Keen, safety director, Armstrong Cork Co., Lancaster, Pa.

Executive Committee Pulp and Paper Section

The following new officers and committees were elected to serve for the year 1951-52:

Officers

General Chairman—H. B. Goodrich, maintenance and safety engineer, Strathmore Pape- Co., West Springfield, Mass.

Vice Chairman and Program Chairman—A. E. Minor, safety supervisor, Ontario-Minnesota Pulp & Paper Co. Ltd., Kenora, Ont., Canada.

News Letter Editor—Arthur Carle, safety director, Northwest Paper Co., Cloquet, Minn.

Seecretary and Membership Chairman—Dallas E. Henry, safety coordinator, Southern Advance Bag & Paper Co., Hodge, La.

Medical Advisor—Dr. James Stark, medical director, Hammermill Paper Co., Erie, Pa.

Regional Membership Representatives—East, H. B. Heubner, insurance manager, Flinttkote Co., New York, N.Y.; South, C. C. MacPike, safety director, St. Regis Paper Co., Pensacola, Fla.; Great Lakes, E. V. Johnson, safety supervisor, Kimberly-Clark Corp., Neenah, Wis.; West, Ernest Dutcher, safety engineer, Flintkote Co., Los Angeles, Cal., and Canada, Douglas B. Chant, secretary-engineer, Ontario Pulp and Paper Makers' Safety Association, Toronto, Ont., Canada.

Committees

Statistical Committee—Gordon Lemke (Chairman), safety engineer, Employers' Mutual Liability Insurance Co., Wausau, Wis.; R. W. Croucher, safety officer, Minnesota & Ontario Paper Co., International Falls, Minn.; Lambert Louy, safety director, Container Corp. of America, Chicago; George Merriman, coordinator of personnel, International Paper Co., Mobile, Ala., and W. H. McLaughlin, director of safety and sanitation, Lily-Tulip Cup Corp., College Point, L.I., N.Y.

Contest Committee—A. Scott Dowd (Chairman), president, Fritz Publications, Inc., Chicago; J. Fred Berry, personnel manager, Alton Box Board Co., Alton, Ill., and W. R. Cahill, director, Personnel Administration, Nekoosa-Edwards Paper Co., Port Edwards, Wis.

Pulpwood Logging Division

Fred T. Morrish (Division Chairman), safety supervisor, Ontario-Minnesota Pulp & Paper Co., Ltd., Fort Frances, Ont., Canada.

Publications Committee—Seth Jackson (Chairman), safety officer, U.S. Forest Service, Washington, D. C.; Leland W. Hooker, timber technologist, Forest Products Research Div., Michigan College of Mining and Technology, Houghton, Mich.; John E. Schueler, executive secretary, Forest Products Safety Council of Michigan and Wisconsin, Rhinelander, Wis., and John Mader, safety engineer, Employers' Mutual Liability Insurance Company of Wisconsin, Ironwood, Mich.

Visual Aids Committee—Harry H. Jefferson (Chairman), training officer, American Pulpwood Association, New York, N.Y.; John Currie, safety office, Great Lakes Paper Co., Fort William, Ont., Canada, and J. C. Rodgerson, safety director, Brown Co., Berlin, N.H.

Paper Converting Division

Robert W. Gray (Division Chairman), safety director, Union Bag & Paper Corp., Savannah, Ga.

Bag Manufacturing Committee—R. G. Belknap (Chairman), safety inspector, Bemis Bros. Bag Co., St. Louis, Mo., and Martin Maney, director of training, St. Regis Paper Co., Pensacola, Fla.

Box Manufacturing Committee—A. O. Vranek (Chairman), safety director, Container Corp. of America, Chicago; G. J. Bienvenu, general superintendent, Container Div., Gaylord Container Corp., Bogalusa, La., and Grant Shibley, safety engineer, Ohio Box Board Co., Rittman, Ohio.

Roofing Manufacturing Committee—Hugh Jackson (Chairman), manager of safety and training, Johns-Manville Corp., New York, N.Y.; Paul B. McInerney, insurance and safety manager, Lloyd A. Fry Roofing Co., Summit, Ill., and Frederick A. Schulze, director of industrial relations, Ruberoid Co., Joliet, Ill.

Insulation Manufacturing Committee—Gordon Allen (Chairman), personnel manager, Wood Conversion Co., Cloquet, Minn.; W. E. Blackledge, safety supervisor, Masonite Corp., Laurel, Miss., and Amos S. Keen, safety director, Armstrong Cork Co., Lancaster, Pa.

Specialties Manufacturing Committee—Vincent P. Coulon, safety director, Sealright Co., Inc., Fulton, N.Y.; A. J. Homblette, safety supervisor, Kimberly-Clark Corp., Neenah, Wis., and W. L. Lauer, safety chairman, Dixie Cup Co., Eastman, Pa.

Pulp Manufacturing Division

Julius A. Draper (Division Chairman), director of safety, Consolidated Paper Corp., Ltd., Grand 'Mere, Que., Canada.

Publications Committee—D. V. Hill (Chairman), safety director, Mead Corp., Kingsport, Tenn.; R. Chapman, chairman, mill accident prevention committee, Howard Smith Paper Mills, Ltd., Cornwall, Ont., Canada; A. S. Cook, manager, Quebec Pulp and Paper Safety Association, Quebec, Que., Canada, and F. O. Soughton, service and safety supervisor, LongLac Pulp & Paper Co., Ltd., Terrace Bay, Ont., Canada.

Visual Aids Committee—Marion L. Hodges (Chairman), safety director, West Virginia Pulp & Paper Co., North Charleston, S.C.; George S. Nelson, claims and safety manager, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.; E. J. Marquardt, safety director, National Container Corp., Tomahawk, Wis.; George Pearce, safety officer, Bathurst Power & Paper Co., Ltd., Bathurst, N.B., Canada, and Cyril D. McCan, assistant safety engineer, Crossett Paper Mills, Crossett, Ark.

Paper Manufacturing Division

E. B. Lambton (Division Chairman), safety engineer, St. Regis Paper Co., New York, N.Y.

Publications Committee—Francis H. Wagner (Chairman), director of safety, Mead Corp., Chillicothe, Ohio; Robert K. Meredith, safety director, West Virginia Pulp & Paper Co., Tyrone, Pa.; L. J. Crichton, safety director, Camp Mfg. Co., Franklin, Va.; Otto Sherman, safety supervisor, mill division, Gaylord Container Corp., Bogalusa, La., and C. R. Johnson, personnel director, Cornell Wood Products Co., Cornell, Wis.

Visual Aids Committee—James N. Conaway (Chairman), safety director, Scott Paper Co., Chester, Pa.; Howard H. Dyke, safety and personnel, International Paper Co., Glens Falls, N.Y.; Robert J. Gell, staff assistant, paper mill, Eastman Kodak Co., Kodak Park, Rochester, N.Y., and G. Russell Leonhard, director of safety, Paterson Parchment Paper Co., Bristol, Pa.

Nine-Month Report on 1951 Industry Safety Contest

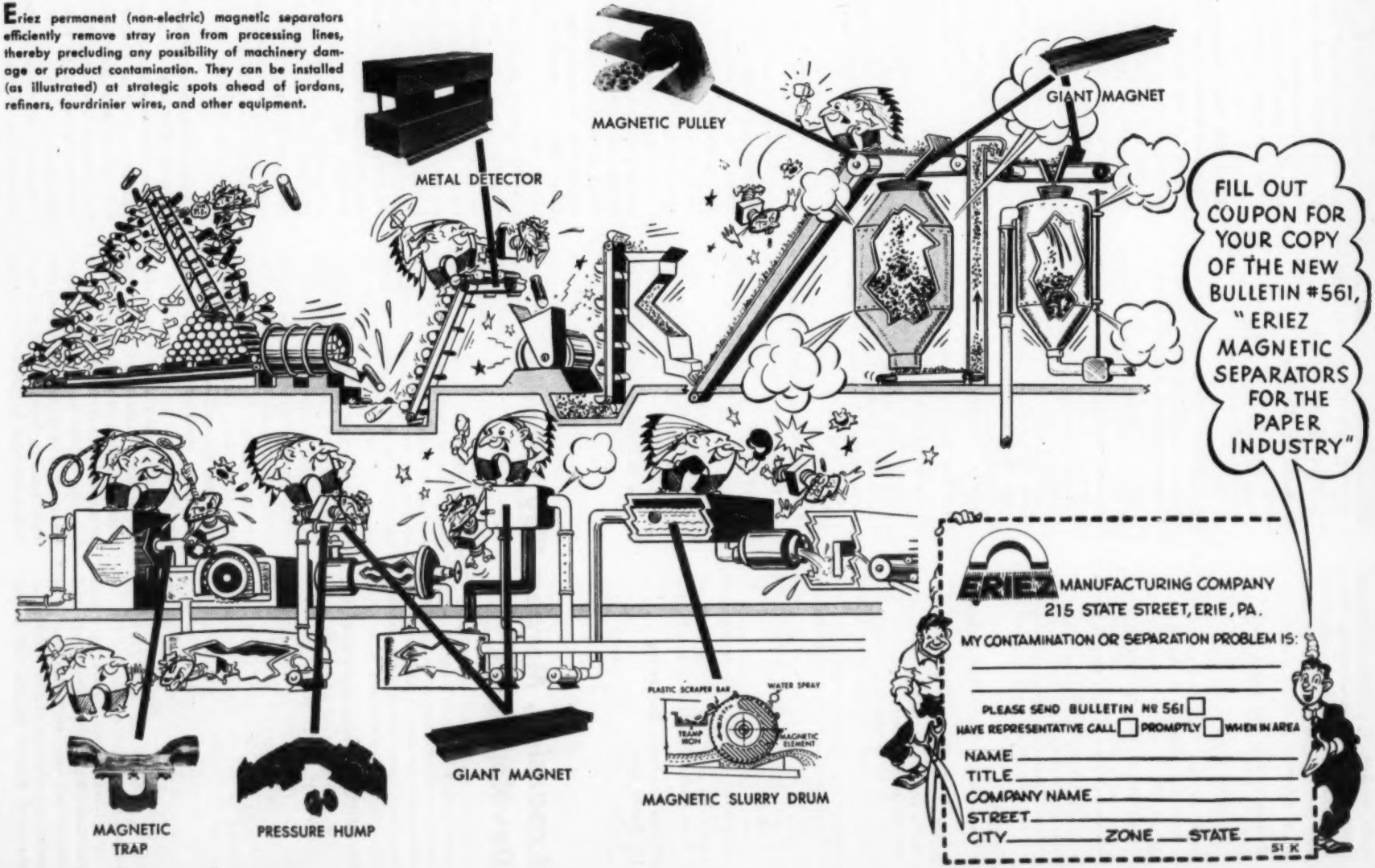
Compared with the identical period last year, the nine-month frequency rate in the 1951 Paper Industry Safety Contest is down 3 per cent. Forty-sjx contestants have maintained perfect scores.

The average rate for the month of September, compared with the August rate, is down 6 per cent. There was a slight reduction in the cumulative rate, but not enough to figure a percentage value. The drop in rate for the nine-month period is due solely to an increase of 5 per cent in the exposure, as 73 more workers have been injured in 1951 than were injured last year; this is an actual count from the reports now in, and will increase considerably by the time all late reports are received.

During September there were 9.21 reportable disabilities per million man-

HOW TO STOP TRAMP IRON DAMAGE...

Eriez permanent (non-electric) magnetic separators efficiently remove stray iron from processing lines, thereby precluding any possibility of machinery damage or product contamination. They can be installed (as illustrated) at strategic spots ahead of jordans, refiners, fourdrinier wires, and other equipment.



hours worked. The January-September figure is 9.80. And the percentage change from 1950 is down 3 per cent. Firms with perfect records through September are as follows:

Division I—Pulp and Paper Mills

Group A

No perfect scores in this group.

Group B

Bemis Bros. Bag Co., Peoria, Ill.

Group C

West Virginia Pulp & Paper Co., Williamsburg, Pa.
Brunswick Pulp & Paper Co., Brunswick, Ga.
Lawrence Paper Co., Lawrence, Kan.
Congoleum-Nairn, Inc., Cedarhurst, Md.
Riegel Paper Corp., Warren Plant, Warren Glen, N. J.

Group D

Certain-teed Products Corp., Marseilles, Ill.
Mead Corp., Wheelwright Div., N. Leominster, Mass.
U. S. Gypsum Co., Oakmont, Pa.
Mead Corp., Manistique, Mich.
Lloyd A. Fry Roofing Co., Summit, Ill.
Marathon Corp., Ashland Div., Ashland, Wis.
Mead Corp., Nashville, Tenn.
Riegel Paper Corp., Hughsville Mill, Riegelsville, N. J.
Lloyd A. Fry Roofing Co., Compton, Cal.
Riegel Paper Corp., Riegelsville (N. J.) plant.
Amalgamated Roofing Mills, Chicago.
Spaulding Fibre Co., Hayes Plant, N. Rochester, N. H.
Johns-Manville, Tilton, N. H.
Volney Felt Mills, Inc., Mishawaka, Ind.

Division II—Paper Converting

(1) Paper Bags

St. Regis Paper Co., San Leandro, Cal.
St. Regis Paper Co. Ltd., Dryden, Ont.
Thilmany Pulp & Paper Co., Kaukauna, Wis.
St. Regis Paper Co., Watertown, N. Y.

(2) Boxes and Cartons

Group A

Stone Container Corp., Chicago.
Fibreboard Products, Inc., South Gate, Cal.

Group B

Hankins Container Co., Union, N. J.
Container Corp. of America, Greensboro, N. C.
Container Corp. of America, Baltimore, Md.
Gaylord Container Corp., Greenville, Tenn.
Gaylord Container Corp., Tampa, Fla.
Container Corp. of America, Sixth St., Philadelphia.
South West Box Co., Sand Springs, Okla.
South West Corrugated Box Co., Fort Worth, Tex.
Hankins Container Co., Miamisburg, Ohio.
Bay West Paper Co., Green Bay, Wis.

(3) Roofing Paper

Rubberoid Co., Gloucester, N. J.
Johns-Manville, Marrero, La.
Lloyd A. Fry Roofing Co., Stroud, Okla.
Lloyd A. Fry Roofing Co., San Leandro, Cal.
Johns-Manville, Los Angeles.

(4) Insulation and Building Board

No perfect scores.

(5) Specialties

Old Colony Envelope Co., Westfield, Mass.
Kimberly-Clark Corp., Appleton, Wis.
Research Products Corp., Madison, Wis.
Lily-Tulip Cup Corp., French Lick, Ind.
Lily-Tulip Cup Corp., Monticello, Ind.

Division III—Pulpwood Logging

No entrants.

Expansion, Mergers Key Canadian Developments

Mill expansion and modernization plans throughout Canada have characterized recent progress in that country's pulp and paper industry. Newsprint production is one of the major themes, with the sulphur shortage deterring completion of some of the recently announced expansion programs. In the west companies are investigating the possibilities of development of interior regions in the constant search for larger supplies of raw materials.

MacMillan-Bloedel Merger O.K'd.

Approval was given recently by shareholders of H. R. MacMillan Export Co. Ltd. for the merger of that company with Bloedel, Stewart & Welch Ltd., operating on Vancouver Island. The uniting of two of British Columbia's largest forest products manufacturers is to be accomplished by issuing MacMillan company shares in exchange for the outstanding shares of Bloedel at a fixed rate of exchange. The new firm will be known as MacMillan & Bloedel Ltd.

Conclusion of long negotiations placed the share ratio at 43 per cent for Bloedel and 57 per cent for MacMillan. The common, preference and "B" preference shares of Bloedel holders will be exchanged for 2,281,582 Class "B" shares of MacMillan. A pro-form consolidation balance sheet at June 30, 1951, shows a strong position with over $48 million current assets against about $20 million current liabilities. Fixed assets stand at over $20 million, buildings and equipment over $30 million, and roads and railways at about $53 million, all less reserves etc.

Over $45 million has been retained for use in the business from earned surpluses. Consolidated earnings of the two companies for a five-year period covering 1946 to 1950 inclusive shows a net profit of $16,837,000. For the nine months ending June 30, 1951, the MacMillan company has shown a net profit of $12,868,000 with Bloedel showing $3,862,000 net profit at June 30, the end of a six-month period. Increase in the MacMillan earnings is largely due to sales from bleached kraft pulp; the mill came into operation in August 1950.

Early Elk Falls Production Scheduled for June 1952

Although Elk Falls Co's. newsprint mill which is now being constructed at Duncan Bay, B.C., will not be in official production until the fall of next year, officials feel that the run-in period will begin in June.

The $40,000,000 plant is jointly financed by Canadian Western Lumber Co. Ltd. and Pacific Mills, Crown Zellerbach's Canadian subsidiary. Early construction was hampered by 1950's severe winter, while summer forest closures on the west coast of British Columbia have stalled portions of the project, such as pipeline work. However, the production schedule is now being met, and the pipeline between Quinsam and Campbell River is expected to be finished by early December.

About 825 men are at work on the 70-acre mill site, and foundations for the sawmill have reached an advanced stage. Blocks will be conveyed by flume for a distance of about 400 feet, after sawing and barking, to the groundwood room. Here six units are to be installed, with space for doubling this number.

The water system embodies a 300,000-gallon main storage tank and a 100,000-gallon fire protection tank. Permanent boiler installations are to be held over until spring. Winter heating is to be obtained from a temporary boiler. The smoke stack, now in its initial stages, will be 150 feet high and 12 feet in diameter.

The mill will be serviced by rail car barges, which will be able to put cars ashore on the 400-foot wharf. The barges will be put along side on the shore side of the wharf, leaving the off shore side for the deep sea vessels. Track is already laid and a locomotive is operating.

The 284" paper machine is designed for 2,000 feet a minute and will have an output of about 240 tons of newsprint a day. Elk Falls will be the first completely new newsprint mill in Canada in about 20 years.

Danish Firm May Produce Pulp in Canada

Rumors have spread through western Canada to the effect that East Asiatic Co. Ltd., Copenhagen, Denmark, may be planning to enter pulp production. The firm is headed by Prince Axel of Denmark.

Basis for the rumor is the fact that Gibson Bros. Logging Co. and Tahsis

Logging Co., both subsidiaries of East Asiatic, were at one time contenders for the old Sorg mill at Port Mellon, now being completely remodeled by Canadian Forest Products Ltd. In addition, the company has applied for a forest management license, which will include some of its holdings on the west coast of Vancouver Island, plus an additional 35,000 acres, bringing the license up to a total of 132,000 acres. As the government forest service has been forming a policy of letting licenses only to firms able to establish a fully integrated utilization plan, no doubt such a move must be in the bargain.

However, the license application immediately was opposed by Canadian Forest Products and Bloedel, Stewart & Welch. They claimed the 35,000 acres were needed to maintain established communities rather than for starting a new settlement on Muchalat Arm, where East Asiatic plans to put a sawmill and plywood plant and the rumored pulp mill. Dr. C. D. Orchard, chief forester and Deputy Minister of Lands, feels that no public hearing will be required and that the matter can be settled to satisfaction.

Power-Pulp Conflict Rumored in Western Canada

The Arrow Lakes region in the interior of British Columbia is being studied by two groups hoping for its future development. Celanese Corp. of America, which has long been rumored to be seeking pulp development in the area, is meeting claims against the power potential of the extensive water systems in the region. While no official statements have been made on the part of Celanese officials, it is reported that water, air, and land surveys are being made in the area.

Opposition comes from U.S. power authority officials, who see the Arrow Lakes area as a storage basin for more water reserves for the Bonneville development. Should the power group be successful and Canadian demands for part of the power production met, some billion and a half of timber would come under flooding. Canadians are also considering the future productive capacity of the land, which is the site of some of the best timber in British Columbia.

Celanese plans are said to include a high alpha pulp mill, a newsprint mill, a sawmill and other forest industries to insure complete utilization. First reports are that the timber of the area is proving to be excellent. Power for such a project could come from the Whatshan development of the B.C. Power Commission or from the $30 million power development of Consolidated Mining and Smelting Co. on the Pond Oreille river. According to an official statement, Whatshan power output would have to be doubled to fulfill this need.

It is reported that an option has been taken up on the timber around Castelgar in the Arrow Lakes region. This has long been rumored at the proposed site of the Celanese mill.

Powell River Sets World Production Record

Powell River Co. Ltd. has established a new world record for daily newsprint production. The mark set recently was 1,049.9 tons in a 24-hour period, smashing the old record of 1,047.7 tons, also held by Powell River.

In 1912 when the mill opened, daily production was only 100 tons. Production stepped up to 650 tons by 1936 and in 1948 it reached 720 tons daily. In 1948 Powell River's No. 8 machine was installed; it was designed to run at over 2,000 feet per minute, and initial speeds have been steadily increased towards that goal. Many other factors, such as available power, pulp strength and so on, enter to determine the actual machine speed over and above design of equipment. So far the machine has hit a top speed of 1,711 feet per minute.

It has only been two years since Powell River was the first mill to top 1,000 tons per day, and this was with the same equipment as is running today. The 49.7-ton increase has been achieved through increased efficiency.

New $20,000,000 Alberta Mill to be U.S.-Financed

Announcement has been made that a $20,000,000 sulphate mill is in the planning stage for Red Deer, Alberta. Construction is expected to begin late in 1953. It has been reported that U.S. capital would provide the total financing for the new firm, which is to be known as Alberta Pulp Mills Ltd.

The daily capacity of the mill is to be 200 tons of bleached kraft pulp, with the firm receiving perpetual rights on 2,000 square miles of forest area about 100 miles from Red Deer. That town was chosen for the mill site because townsite costs could be reduced by $4,000,000 or more. Also, the area offers natural gas, water, saltcake, and available caustic. Production is to go to the Midwest U.S. markets.

Canadian Firm Executives Become Shareholders

Canadian Western Lumber Co. has adopted an incentive plan whereby key employees are granted the right to buy shares in the firm to increase their interest over and above that offered by bonus and pension plans. Canadian Western is the partner company with Crown Zellerbach's Canadian subsidiary, Pacific Mills, in the Elk Falls $45,000,000 newsprint development. The following plan was adopted at a meeting of shareholders at Vancouver, B.C., October 16:

A further 127,000 no par value shares of capital stock were voted, these to be sold to employes at a price based on August 9, 1951, quotations, which were slightly under $10 per share. The purchaser must make a 5 per cent down payment and a further 5 per cent or more within the first year. The balance is payable on such terms as the directors think suitable.

The purchaser must only agree not to assign or dispose of any part of his interest until the shares are fully purchased, except by special arrangement with the directors.

Pulp Logs Being Brought from B. C. Interior

For the first time in logging history logs are being brought from the interior of British Columbia to be manufactured into pulp. Hemlock logs are being shipped by train from districts beyond Kamloops, where more than a billion feet of decaying timber is standing. The logs proved unsuitable for lumber, but are first-rate pulp material, and the movement now appears to be a permanent situation.

A chipper plant has been erected in North Vancouver by Wood, Fahlman & Co., engineers and contractors, and a ready sale has been found for the chips in the pulp mills of the area. Traffic of interior logs started during closures caused by the extended West Coast fire season when interior operations were kept dampened down by frequent rains and could keep their operations open.

B. C. Mills to be Linked by Road to Vancouver

Inauguration of the Black Ball ferry system to link Horseshoe Bay on the outskirts of Vancouver with Gibson's Landing, situated only a few miles from Port Mellon, will bring the Port Mellon pulp mill within a short distance of a road link to the nearest major city. Owners of the pulp mill plan to put the seven-mile road link through as soon as possible. It will then open the mill to a number of other settlements up the coast.

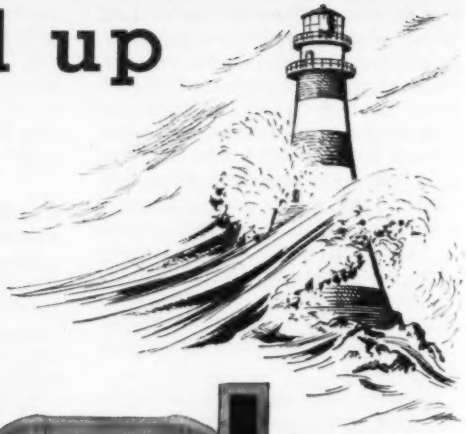
The road from Gibson's Landing now runs to Powell River, where plans are being rushed to complete the 25-mile gap which now separates a ferry link and the end of the road. It is hoped to have the link in by 1953. The Black Ball ferry is making five trips daily and will carry 48 cars and 600 passengers.

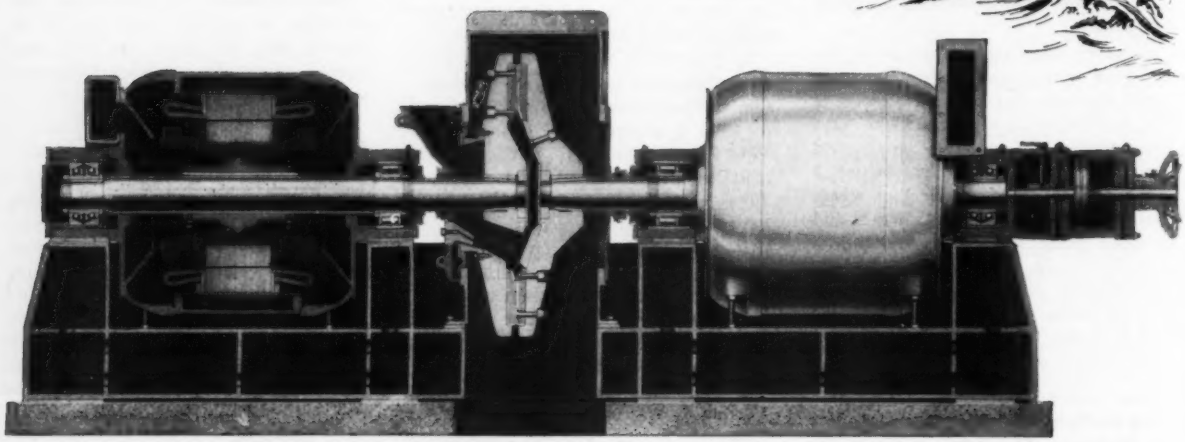
Ontario Controls Seed Source

The Ontario Forestry Administration is planning to acquire tree seeds from "orchards" set aside for the purpose of

built to stand up

and take it





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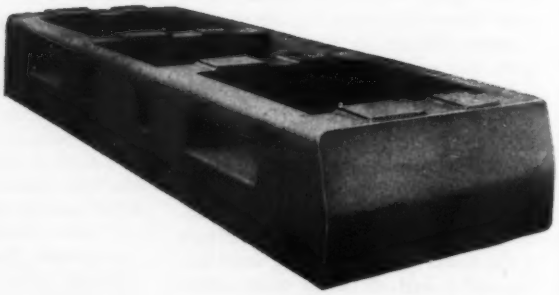
The base is so strong and substantial that there is no distortion to cause misalignment of shafts and bearings. Not even bolted to a foundation, the base rests securely on leveling wedges.



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producing seed of desired species. The action is being taken because most species run in unpredictable cycles in their seed-bearing years.

Red pine is in short supply, and as this is a favored species in reforestation projects, steps are being taken to tide over the poor years. Combined efforts of the University of Toronto, the Research Council of Ontario, and the Dominion Forest Insect Laboratory at Sault Ste. Marie will supply details for the study.

Ontario Forestry Programs Benefit from Higher Rates

The Ontario government has announced that several million dollars additional revenue will be available from a recent increase in stumpage rates. About 1,000 pulp, paper and sawlog companies will be affected by the change, which is retroactive to April 1, 1951. Revenues will be used to expand programs of forest management and reforestation in Ontario.

The new rates apply to all timber cut on ungranted public lands and lands where timber remains the property of the province. Hardwood sawlog rates that previously stood at $2.70 per thousand board feet are now to be $5 per thousand. Cedar, hemlock and tamarck, previously at $1.70 are now $3; red pine and white pine jumped from $2.85 to $5.

In pulpwood, spruce jumped from $1.70 per cord to $2.80. Other species doubled from their previous rates, making balsam and jack pine $1.40 and hardwoods $1. At the same time it was announced that use of the Doyle rule would give way to the use of the International Rule over the next five years as contracts expired.

St. Lawrence Paper Mills Ltd.
is planning to spend $7,000,000 on improvement and expansion of its plant at East Angus, Que. The expansion plan will stabilize the firm's operations.

Bowater Newfoundland Pulp & Paper
has announced authorization of $10,000,000 in expenditures for expansion of the Corner Brook mills. The program, scheduled over a period of years, is to increase production of newsprint and sulphite pulp. One or two digesters are to be installed, plus additional screens. Stock storage and the blending plant will be completely modernized, and a 6,000 kw. diesel-electric generator will be installed.

The School of Paper-Making
of the Province of Quebec, Three Rivers, was officially opened October 17 with Prime Minister Maurice Duplessis officiating. The school has been active for several years, but a new miniature papermill, complete with laboratories, has been recently constructed, making the school a model in the field.

Bloedel, Stewart & Welch, Ltd.
has completed construction of a laboratory building at its Port Alberni kraft mill on Vancouver Island, B.C. The $100,000 structure measures 90 by 40 feet. At the present time only the first floor is being used. The second has been designed to house a research department, which is to be established in the near future. Equipment installations to date include a cyclone, condenser, accumulator tank, pumps, and motors. Piping and ductwork has been installed on the blowtank in order to study additional heat recovery and do experimental work on the reduction of mill odors from kraft pulp.

Government Rules, Orders Affect Industry

Washington developments during the past several weeks have included many orders and rulings directly affecting the production of paper. Most action has been taken by the National Production Authority and the Office of Price Stabilization, where numerous industry meetings have been held in an effort to determine proper ceiling regulations and pricing methods.

Rules for Government Orders Amended

NPA recently amended Order M-36, which provides rules for placing, accepting and scheduling government or rated orders for paper. The action was taken primarily to correct certain obsolete provisions of the order.

Section 1 has been amended to make it clear that all persons placing government or rated orders for paper are subject to the order and not just paper manufacturers. Section 8 states that no person shall falsely represent an order as "from the government." No one may apply or extend a rating or claim benefits under M-36 for paper after he has received the paper for the government. Manufacturers, while still required to file Census Form M-14-A, will no longer report government orders on this form. However, each paper manufacturer hereafter must file by the last day of each month two reports on Form NPAF-27 showing government orders scheduled for production—both in the next following month and the second succeeding month.

Ticoulat Made DPA Deputy

Gabriel J. Ticoulat, deputy assistant administrator of NPA's Chemical, Rubber and Forest Products Bureau since May, has been appointed DPA deputy administrator for international problems. He succeeds Edwin T. Gibson, who resigned recently, and will act on all international matters relating to materials and their production and allocation. Mr. Ticoulat, on leave as vice president of Crown Zellerbach Corp., will be the spokesman for all foreign claimants on the DPA Requirements Committee, will represent the administrator on the DPA Vital Materials Coordinating Committee, and the ODM Foreign Supply and Requirements Committee. In addition, he will be chairman of the policy committee, which will advise the administrator of the Defense Materials Procurement Administration.

Protests Wood Pulp Ceilings

Gould Paper Corp., Lyons Falls, N.Y., appeared before an OPS board of review in Washington, D.C., recently to protest recent rulings on wood pulp ceilings. The producer of printing paper directed its attack at the requirement of CPR 49 that transportation costs up to $16 per ton of unbleached sulphite and of groundwood pulp be absorbed by the seller. The firm maintained that, in the case of unbleached sulphite, this absorption requirement would result in a ceiling price approximately $3.60 less than the company's actual manufacturing cost.

Non-Defense Chemical Ratings Dropped

NPA recently lifted all priority ratings for chemicals except those ordered by the Defense Dept. and the Atomic Energy Commission. This action requires all other users of chemicals to buy them through normal market procedures without the assistance of any ratings.

The agency said it was acting to break an order "pile-up" that has created "unnatural shortages which threatened disruption of chemicals distribution pattern and, in some instances, caused delays on vital defense orders." The order, it is hoped, will relieve the situation by making certain that vital defense needs are met first and by giving an equal footing to all other users of chemicals.

Customs Court Cases

A Seattle importer of paper for newspaper use has filed protest against the action of Customs officials in holding five shipments dutiable as printing paper

and denying free entry as newsprint, according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry. The official action was based on several characteristics in which the imported paper differs from standard newsprint as described in Treasury Department rulings. Some of the papers carry an excess of filler, others are excessively sized, some are composed of more than 30 per cent chemical fibre, and others are in novel news thicknesses. The protests were placed on the October docket of the Customs Court at Seattle, but will not be tried until a later date.

An importer of wrapping paper carrying screenings has abandoned his claim that the paper, classified for duty as miscellaneous wrapping paper at 25 per cent, was properly dutiable as kraft wrapping paper at 20 per cent.

Waxed crepe paper imported at Detroit has been classified for duty as creped paper at 3 cents per pound, and 7½ per cent, and not as waxed paper at 1½ cents per pound and 10 per cent; and ruled and unruled cards imported from Canada have been classified for duty at the rate for bristol boards, not at the lower rate for paperboards.

OPS Ceilings

OPS has announced various orders and regulations governing price ceilings:

Glassine and Greaseproof Ceilings

Dollars-and-cents ceilings on glassine and greaseproof papers have been issued. Following are the announced base prices per hundredweight, f.o.b. mill:

For 25-pound base No. 1 bleached glassine papers, in wrapped rolls 12" or more in diameter, 6" or more wide, wound on 3-inch inside diameter cores, $22.50; for 25-pound base No. 1 bleached greaseproof papers, in wrapped jumbo rolls not rewound, 12" or more in diameter, 18" or more wide, wound on 3-inch inside diameter cores, $20.

The following differentials are added to base prices for basis weights of less than 25 pounds: $0.60 per hundredweight for each pound below 25 pounds basis weight, down to and including 20 pound; $1.50 per hundredweight for each pound below 20 pound base weight, down to and including 16 pound; $3 per hundredweight for each pound below 16 pound basis weight.

Converted Paperboard Products

OPS has issued a tailored regulation covering paperboard boxes, tubes, cans, cores, drums, and other converted paperboard products widely used by American industry in packaging its goods. The new regulation, CPR 84, establishes prices approximately at the levels prevailing under GCPR.

Under the order manufacturers employ the same pricing formulas used in the base period of January 25 to February 24, 1951, unless during that interval they sold by price lists. In such cases they may continue to price according to their lists if they use the list for all products listed.

Unbleached Kraft Paper

A tailored regulation for unbleached kraft paper has been issued that will maintain ceilings on 80 per cent of the production at the same general level prevailing under the GCPR and substantially below the ceilings that manufacturers would have been entitled to under the Manufacturers' CPR 22.

Ceilings on the 20 per cent balance of production will be at or below the levels established under CPR 22, adjusted downward to reflect the rollback on woodpulp prices effected under CPR 49. The new ceilings, prescribed in CPR 88, effective October 29, recognize two well-defined economic segments existing in the industry.

Dollars-and-cents ceiling prices have been spelled out for seven key grades of kraft paper, manufactured in the South and West, amounting to 60 per cent of the country's production, at levels approximating weighted of GCPR prices. Ceilings on the other grades manufactured by these mills, amounting to another 20 per cent, are determined under the new regulation by applying customary differentials.

Ceilings for the balance of the unbleached kraft paper industry, comprising seven integrated and 15 converter mills in the Northeast and Lake States, plus three converter mills in the South, are either the ceiling prices they had in effect during the period January 24 to February 25, 1951, or the ceilings they had in effect immediately before the issuance of the new regulation.

The dollars-and-cents ceilings on the seven key grades produced by southern and western mills, in base price per hundredweight, are as follows: Wrapping paper, counter rolls, $7.75; butchers paper, counter rolls, $8.25; grocers and variety bag paper, mill rolls, minimum diameter 26", $7.50; shipping sack paper, mill rolls, minimum diameter 26", $7.50; gumming paper, mill rolls, minimum diameter 22", $8.00; asphalting paper, mill rolls, minimum diameter 24", $7.75, and envelope paper, mill rolls, minimum diameter 26", $9.25.

These ceiling prices apply to basis weights of 50 lbs. and up, except for envelope paper, which is for substance 20 lbs. and up, f.o.b. mill, carload lots, with up to $10 per ton freight allowed.

Differentials are spelled out for determining ceilings on certain other basis weights under 50 lbs. and certain variations in the size of rolls and for paper trimmed in sheets. Differentials for other variations are determined by comparison with the other differentials maintained by the manufacturer on August 1, 1951. In pricing grades not covered by the foregoing prices and differentials, a southern or western integrated mill determines its "reference grade," which is its best selling grade among the seven key grades, as determined by tonnage produced during the first half of 1950. To price a new grade not previously manufactured, a manufacturer takes as his ceiling a price not higher than the ceiling price of the most closely competitive mill selling the same grade.

OPS Subcommittees

Proposed tailored regulations, manufacturers' ceiling prices, and dollars and cents ceiling prices have been discussed recently by numerous industry subcommittees. Among them were the Food Container Paperboard Subcommittee, the Western Softwood Plywood and Veneer Manufacturers Subcommittee, the Douglas Fir Area Lumber Manufacturers Subcommittee, the Western Pine Industry Subcommittee, and the Sulphite Paper Subcommittee.

Industry Advisory Committees

Industry advisory committees in meetings with OPS officials during the past several weeks have discussed general problems relating to pricing and material conservation.

Magazine IAC

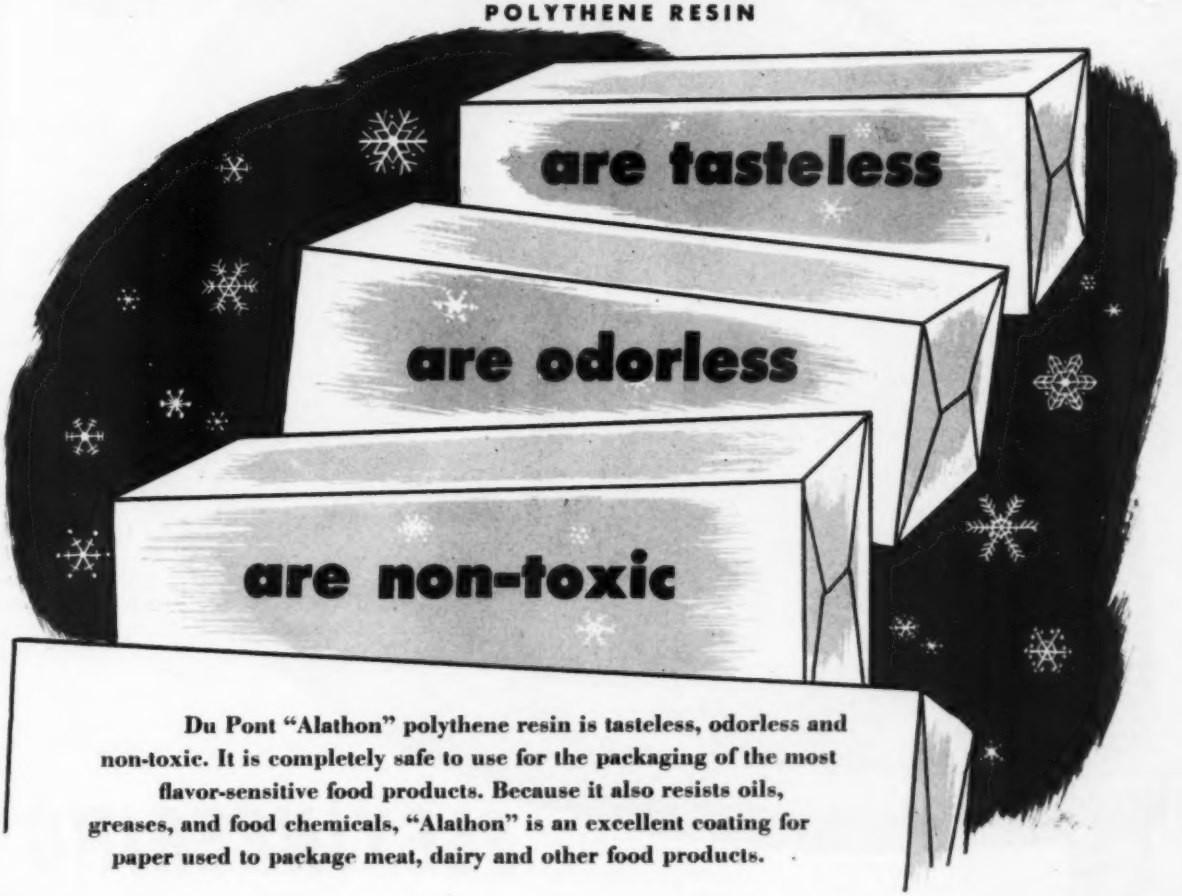
The Magazine Industry Advisory Committee has recommended that NPA explore with the Department of Justice possibilities of drafting a formula for paper conservation within segments of the magazine publishing industry similar to the agreement worked out with Boston newspaper publishers, which allows NPA and the publishers to discuss ways of reducing wastage of newsprint. The agreement was worked out after a survey of 11 leading cities showed an annual loss of nearly 184,000 tons of newsprint between press runs and paid circulations.

Northwest Log IAC

Members of the Northwest Log Industry Advisory Committee have recommended that proposed dollars-and-cents ceilings for their products be established for three separate districts in western Washington and Oregon, as follows: Puget Sound District—State of Washington west of the crest of the Cascade Mountains, except Grays Harbor, Pacific, Wahkiakum, Cowlitz, Clark and Skamania counties; Willapa Bay-Grays Harbor District—Washington counties of Grays Harbor and Pacific; Columbia River District—Washington counties of Wahkiakum, Cowlitz, Clark, Skamania and Clickitat; Oregon counties of Ben-

Coatings of ALATHON* on paper

POLYTHENE RESIN



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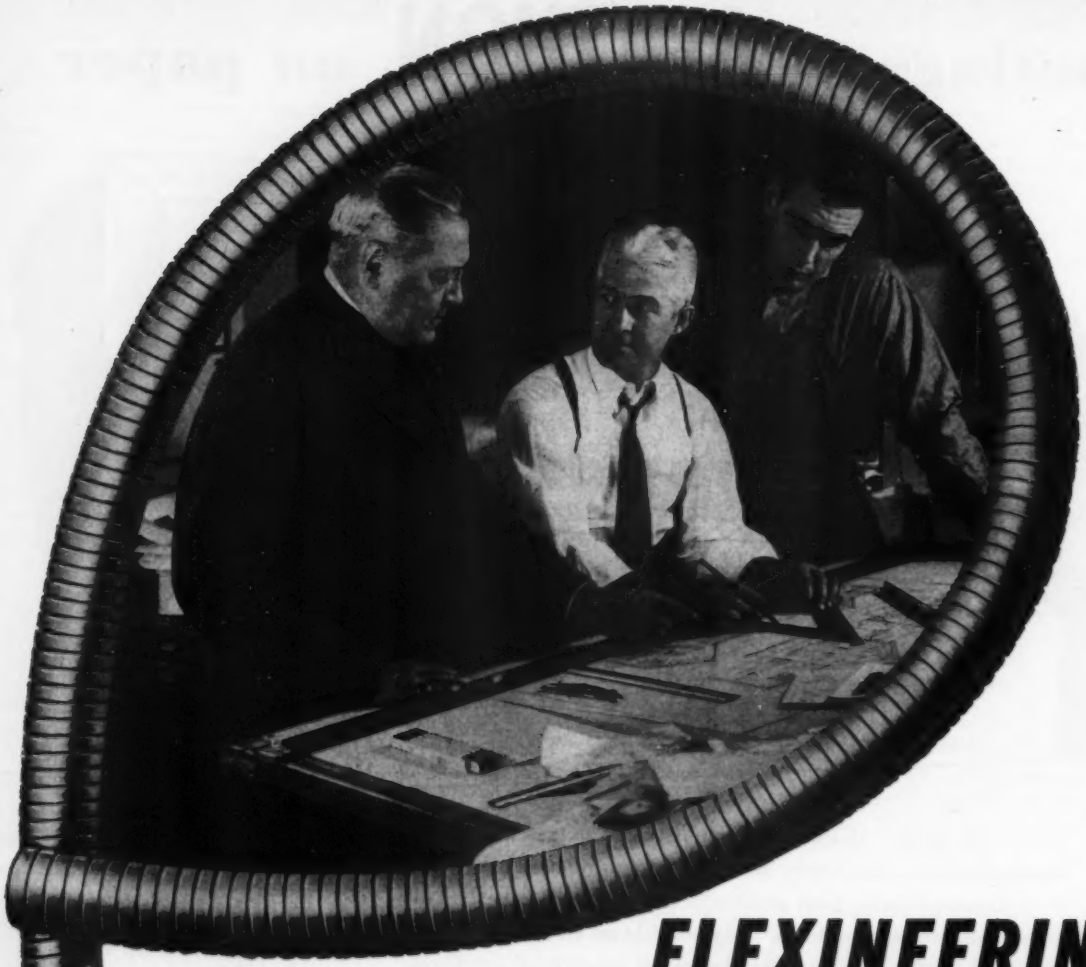

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It was recommended that the remainder of western Oregon not included in the Columbia River District remain under GCPR pending further study of costs and prices in that area. The committee recommended that spelled out ceiling prices prevail at three points of delivery: in towable waters, f.o.b. car, or in the buyer's mill pond. Deliveries at other points would be adjusted to reflect cost of delivery to a point where the ceiling is applicable.

Domestic Woodpulp Consumers IAC

Members of the Domestic Woodpulp Consumers Industry Advisory Committee met recently with OPS officials to discuss levels of prices established under CPR 49, the woodpulp regulation, which establishes dollars-and-cents ceilings for 12 standard grades of woodpulp produced in the U.S. and four imported from overseas. It does not spell out ceilings on woodpulp produced in Canada.

Ceilings on overseas woodpulp are about 50 per cent higher than domestic ceilings. Uncontrolled Canadian prices are 15 to 20 per cent higher than domestic prices. Committeemen discussed the disparity between domestic, Canadian, and overseas prices and the effect on supply that might result from a downward adjustment of overseas pulp ceilings.

Special Paperboard IAC

Detailed recommendations for provisions of a tailored regulation for their industry were made recently by members of the Special Paperboard Industry Advisory Committee. It was proposed that dollars-and-cents ceilings be established for key items produced by the industry. Individual manufacturers would determine their ceilings on other weights and grades by applying to the spelled-out prices the same differentials that they charged during a specified base period. Differentials would also be employed to determine ceilings for differences in quality, sizes of rolls, trim, finish, color, and other particulars. The period of January 25 to February 24, 1951, was considered as the base period. It was recommended that spelled-out prices be applied at f.o.b. mill, with adjustment for the variation in selling practices in the industry.

Coated and Processed Paper IAC

A tailored regulation under which ceiling prices would be determined by formula was recommended recently to OPS by the Coated and Processed Paper Industry Advisory Committee. Under CPR 84 manufacturers employ the formulas they used during the period January 25 to February 24, 1951, to determine ceiling prices, and they are limited to the margins over costs existing in that period. If and when new dollars and cents ceilings are issued covering their raw materials, manufacturers pricing under CPR 84, in computing their ceilings by formula, may include raw material costs up to the levels of the new dollars-and-cents ceilings on the raw materials.

Vegetable Parchment IAC

Dollars-and-cents ceilings for seven basic parchment grades have been discussed by the Vegetable Parchment Industry Advisory Committee. Ceilings on related weights and grades under the proposed regulation would be determined by applying differentials to the spelled-out prices. Differentials existing during a base period would be maintained to cover variations in size of shipments, packing, finishing, terms of sale, and so on. It was proposed to establish ceilings on the following grades: 18-pound vegetable parchment, 27-pound vegetable parchment, 35- to 43-pound lard liner parchment; 40-pound parchmentized kraft, 55- to 60-pound greeting card parchment; No. 80 Egyptian parchment, and No. 475-1-T vegetable parchment. Related grades to be covered would include printed, waxed, colored, puckered, crinkled, opaque, glycerine-treated, mottled greeting card, and can liner parchment.

Asphalt and Tarred Roofing IAC

The Asphalt and Tarred Roofing Products Industry Advisory Committee has suggested that OPS develop a tailored pricing regulation establishing ceiling prices on a basis of an industry-wide price adjustment factor. In this connection it was suggested that separate industry-wide price adjustment factors be developed to cover pricing east and west of the Rockies to conform with the industry practice. The third quarter of 1949 was proposed as a base period.

National Forest Receipts Show Increase

Receipts from national forests during July and August increased more than 43 per cent over those for the corresponding period a year ago, the U.S. Department of Agriculture reported recently. During the two months the Forest Service collected $13,941,122 from the sale of timber, grazing fees, land use permits, and water power rights. For the same period in 1950 the forests collected a total of $9,707,813.

Collections from national forests are deposited in the federal Treasury. Twenty-five per cent of all monies are returned to the states to be used in counties containing national forests for public roads and schools. An additional 10 per cent of the receipts is set aside for the maintenance and construction of forest roads and trails within the state.

Production Called Basis of Progress

The basis of all future progress in this country is production. This was the opinion expressed recently by D. B. Smith, president and general manager of Wausau Paper Mills, Wausau, Wis., in an address before 102 state and national employment workers gathered at the Trees for Tomorrow camp in Eagle River.

We can support the highest standard of living in this world, the paper firm executive said, only by producing the most goods per man hour worked. This goal can be obtained only by maximum production at minimum cost. Cited was the philosophy of the Trees for Tomorrow program, which centers about the creation of a reserve of raw material that will insure the perpetuation of the Wisconsin paper industry and the protection of the watershed that serves the industry's power and water resources.

Wastepaper Use May Reach Record High

An estimated consumption of 7,107,000 tons of wastepaper during the first three quarters of 1951 has led industry spokesmen to predict that the yearly use may top all previous records. It is believed that the total may reach 9,000,000 tons. The forecast was made despite the fact that inventories are now 45 per cent greater then they were at the beginning of the year.

Prices of wastepaper have continued their tumble on the Chicago salvage markets. Mixed paper and old corrugated were in oversupply, and some mill buyers shaded their previous $12 mixed paper quotation to $10 a ton and the $20 corrugated paying priced to $18. News was the steadiest of all bulky grades at $15. However, in the overall picture, mill consumption and demand was far short of potential collections.

Federal Ownership of Forests Attacked by Lumber Executive

Declaring that it is time that the trend toward increasing government ownership of forest land should be halted and if possible reversed, David Graham, financial vice president of Weyerhaeuser Timber Co., recently told a joint meeting of the American Forestry Association and the Society for the Protection of New Hampshire Forests that thousands of over-mature trees are being allowed to rot in national forests. The convention was held at Jefferson, N.H.

Mr. Graham said that the time is past when the forest products industry, including those who cut trees for private

profit, use "cut-out and get-out methods." He said that the privately owned forest products industry is looking to sustained yield and conservation for operations in the future.

New Sources of Paper

Australian Buffalo grass and Kunai grass from New Guinea have been cited as possible sources of high grade paper. An Australian farmer recently told reporters in Sydney that the grass contains sufficient cellulose, but that it must be boiled in caustic soda at 600F for more than four hours to be effective as a source of paper.

While in the United States Department of Agriculture scientists have declared that straw paper might help newspapers dogged by shortages of paper produced from woodpulp. They reported on studies of newsprint made from wheat straw, already used by a Chicago publisher in a test run. It has been estimated that farmers could produce 500,000 tons of straw a year.

Paper Procurement Discussed With Quartermaster Officials

Procurement of paper and paper products by the Army's Quartermaster Corps was discussed recently by members of the Quartermaster Association's Paper and Paper Products Industrial Group and representatives of the Corps at a meeting in New York, N.Y.

Among the speakers were Dr. Louis T. Stevenson of the American Paper and Pulp Association, who discussed the economic aspects of the paper industry; Brig. Gen. H. L. Peckham; Col. Walter H. Pashley (Ret.), secretary of the Association, and officials of the New York Quartermaster Procurement Agency, the Chicago Quartermaster Depot, and the Office of the Quartermaster General.

During the meeting 20 commodity divisions were organized to represent every phase of the paper and paper products industry. Chosen temporary chairman of the group was E. W. Tinker of the APPA.

Members of groups representing the primary grades are as follows:

Book Paper Commodity Divisions: Harold Holden, Oxford Paper Co.; Wiley Jennings, West Virginia Pulp & Paper Co.; W. S. McClennan, P. H. Glatfelter Co., and Harold Wright, Champion Paper & Fibre Co.

Greaseproof Commodity Division: Thomas F. Donoghue, Riegel Paper Corp., and George W. Ross, H. P. Smith Paper Co.

Kraft Commodity Division: Wayne A. Brown, Crown Zellerbach Corp.; H. S. Daniels, Union Bag & Paper Corp.; Dernell Every, Kraft Paper Association; Walter C. Shorter, Camp Mfg. Co., and George Stuhr, International Paper Co.

Newsprint Commodity Division: John R. Kimberly, Kimberly-Clark Corp.

Pulp Commodity Division: Harry A. Binzer, Puget Sound Pulp & Timber Co., and J. J. McDonald, Brown Co.

Specialty Paper and Boards Commodity Division: H. M. Gray, Sealright Co., Inc., and Aubrey K. Nickolson, Hollingsworth & Vose Co.

Sulphite Paper Commodity Division: Wayne Brown, Crown Zellerbach Corp.; J. G. Conley, Fraser Paper, Ltd.; Leo E. Croy, Marathon Corp., and D. F. McCall, Racquette River Paper Co.

Tissue Commodity Division: Wayne Brown, Crown Zellerbach Corp.; Floyd R. Graham, Graham Mfg. Co., Inc., and John McKirdy, Jr., Scott Paper Co.

Vegetable Parchment Commodity Division: C. F. Christy, Kalamazoo Vegetable Parchment Co.; L. E. Huffman, West Carrollton Parchment Co., and E. R. Leonhard, Paterson Parchment Paper Co.

Weatherproof and Domestic Fibre Shipping Containers Commodity Division: C. W. Evert, Downing Box Co.; W. P. Hicks, Gaylord Container Corp.; Albert W. Luhrs, Fibre Box Association; W. Irving Osborne Jr., Cornell Wood Products Co.; J. W. Quarte, National Container Corp.; Henry Rust, Robert Gair Co., Inc.; H. L. Simmons, Jr., Eddy Paper Corp., and W. S. Snyder, International Paper Co.

Writing Paper Commodity Division: John Franzen, Hammermill Paper Co.; Hugh H. Hanson, W. C. Hamilton & Sons; John E. Massengale, Eastern Corp., and Harold Wright, Champion Paper & Fibre Co.

Strathmore Advisory Council Meets

The annual meeting of the Strathmore Paper Co. advisory council was held September 20 and 21 at Woronoco, Mass., at which time six new members were elected for two-year terms: W. E. Porter, Cook-Vivian Co., Boston; Helmer Nelson, J. E. Linde Paper Co., New York, N.Y.; Leonard Raymond, Raymond & McNutt Co., Philadelphia; Fred H. Chatfield, Chatfield Paper Corp., Cincinnati; H. A. Hartinger, Paper Supply Co., Minneapolis, and L. S. Bosworth, L. S. Bosworth Co., Houston. Elected chairman for the coming year was Arthur W. Towne, Blake, Moffitt & Towne, San Francisco.

Speakers at the meeting included F. Nelson Bridgham, Strathmore president, and various department heads and company executives; A. Murray Howe, chief of the raw materials branch, Pulp, Paper and Paperboard Div., NPA; J. A. Chadbourne, president of Old Colony Envelope Co., and Abbott Kimball, president of the advertising firm of Abbott Kimball Co.

The objectives of the Council are the exchange of helpful information, discussion of problems of mutual interest, and the cultivation of friendly relations and confidence between the mill and its distributors. Current members represent 116 distributors.

Industry Notes

Alaska Pine & Cellulose Co.,
jointly owned by the Abitibi and Koerner interests in Vancouver, B.C., is planning the construction of a new office building at Pender. Head offices of the firm are now in Vancouver. The date of completion has not been set.

International Paper Co.
has allotted 10,000 slash pine seedlings to Bullock County, Ala., for distribution to farmers. According to the county agent, farmers were allowed to receive from .1,000 to 5,000 seedlings on request.

Continental Can Co.,
Paper Container Div., was to vacate its Utica, N.Y. plant by November 1. The property is to be used by Bendix Aviation Corp. Representatives of management and labor of the Paper Container Div. met early in October at a dinner that formally marked the end of their local relationship.

Rayonier, Inc.,
will close its obsolete sawmill at Hoquiam, Wash., December 31. The firm has decided to conserve its timber resources for pulp production rather than rebuild the mill for competitive operation. The mill's 225 employees will be transferred to other Rayonier operations or given help in finding employment elsewhere.

Approximately $100,000 Damage
was caused by a fire that roared through Rochester Paper Products Co., Inc., Rochester, N.Y. on September 26. The roof of the building collapsed, one section of wooden wall was destroyed, and flames worked down into a basement and sub-basement of the structure.

$4,000 Damage
was caused September 22 by a fire that gutted a waste paper storage shed at United Board & Carton Corp., Lockport, N.Y. The cause was undetermined.

Two Fires Within 24 Hours
on October 3 and 4 did about $7,500 damage to American Shredded Paper Co., Minneapolis. The blaze attacked bales of paper and rags.

20 to 25 Million Seedlings
will be planted in a tree nursery now being constructed by the state of Georgia on a 140-acre tract between Dawsonville and Gainesville. Work is being rushed

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DRYER FELTS

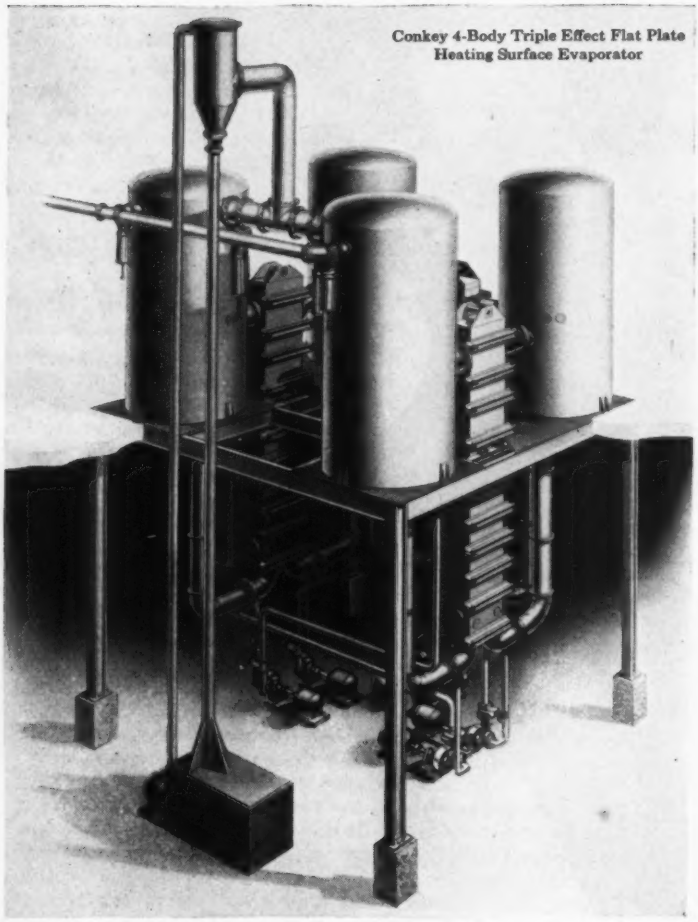
Hooperwood Dryer Felts—Cotton or Asbestos—are engineered for the job they have to do.

Whether the product is kraft, writing, newsprint, linerboard, book, or a specialty, there's a Hooperwood Dryer Felt made just for that job.

Write William E. Hooper & Sons Company
Juniper and Cherry Streets, Philadelphia 7, Pa.

MILLS: WOODBERRY, BALTIMORE, MD.

NO shut down time! stream pollution! scale removal costs!



Conkey 4-Body Triple Effect Flat Plate Heating Surface Evaporator

Conkey Flat Plate Heating Surface Evaporator *with Rosenblad Switching System**

The proven system for avoiding stream pollution by sulphite pulp mill waste liquors that proved so outstandingly successful in commercial installations all over Scandinavia, is now adapted for use in this country by General American. *In every instance* where a Rosenblad Switching System has been installed, shut down time *and* scale removal *costs have been practically eliminated!* The Rosenblad System utilizes the condensate wash as a descaling operation carried on during full capacity operation of the evaporator. Surfaces subjected to boiling liquor are periodically switched with those in contact with vapor and condensate to clean heating surfaces during normal continuous operation. *Every part* of the equipment is switched, consequently scale is washed away from pipe lines, valves and vessels . . . in addition to heating surfaces.

At present in this country . . . Rosenblad Switching Systems in Conkey Flat Plate Heating Surface Evaporators are being constructed for full scale commercial operations. *Write today for detailed bulletin.*

*Patents Applied For

GENERAL AMERICAN TRANSPORTATION CORPORATION

PROCESS EQUIPMENT DIVISION

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN TRADE MARK

Sales Offices: 10 East 49th Street, New York 17, New York
General Offices: 135 South La Salle Street, Chicago 90, Illinois

Sole Licensee in the U. S. A. for the A. B. Rosenblads Patenter Evaporator Switching System

OFFICES IN PRINCIPAL CITIES

Other General American Equipment:
Turbo-Mixers, Filters, Dewaterers, Dryers, Towers, Tanks, Bins, Pressure Vessels

so that the first crop may be produced in time for replanting in the winter of 1952-53. White pine, loblolly, short leaf, long leaf, slash pine, red cedar and yellow poplar are to be grown.

Florida Forest Service
has reported a severe shortage of pine seedlings, which has severely handicapped the state's program for "pine tree prosperity." The Service has been forced to make a 45 per cent cut on all seedling orders of over 5,000. A record breaking 43 million seedlings were ordered before July 1, and the top production is expected to be about 28 million.

A $100,000 Miniature Forest,
showing woodland owners how to quadruple their forestry income, is being displayed at state and county fairs throughout the South. The Southern Pulpwood Conservation Association built the display, which is complete with midget pines, power saws, and a mechanical tree planter on a specially constructed trailer.

American Forest Products Industries,
Washington, D.C., has announced the opening of a field office in Huntington, W. Va. Ben G. Rhodes, former farm editor of the *Raleigh Register*, is to be in charge.

National Paper Trade Association
has been notified that a Federal Trade Commission trial examiner has recommended that a cease and desist order be issued against that organization and its members directing the discontinuance of publication of both the Blue Book and the Brown Book, which compiled merchants' past pricing experiences. Publication of the two books was discontinued more than two years ago.

The Pulp and Paper Laboratory
of the University of Florida is to be expanded if a cooperative agreement can be worked out with the Southern Regional Education Board of Control. The laboratory was established in 1946 and now has equipment worth $250,000. Expansion of the facilities would enable the university to train students from other states. The lab is already the largest of its kind.

Interstate Folding Box Co.,
Middletown, Ohio, observed its 40th anniversary September 26. The firm, founded in 1911 by Samuel Bergstein, has plants in Middletown and Miamisburg. Sales offices and representatives are maintained in 23 leading cities. Robert M. Bergstein, son of the founder, is president of the firm.

Union Bag & Paper Corp.,
Savannah, Ga., has announced the winners of the two forestry scholarships presented annually by the firm. Robert James Beason of Eulonia, Ga., and Warren Guy Garrett of Buena Vista, both sponsored by the future farmers of America, will attend the University of Georgia School of Forestry and receive $1,600 each for four years.

OVER THE BOUNDING MAIN go two representatives of Upson Co., Lockport, N. Y., in this unusual rowboat constructed of the firm's newest product, waterproofed panels. The panels are intended for full-wall dry-built construction of interiors—definitely not for boats. According to the firm, the product could be placed in water indefinitely without disintegration, delamination, or percentible penetration of water. The panels are laminated in six plies of fibre board, are 3/8" thick, and are six times as strong as plaster.

While 25,000,000 Paper Cups
and food containers have been stockpiled in 20 target areas of the United States for emergency use in this country, British industrialists are having to stockpile vastly more cumbersome stores of china against atomic disaster. Paper for emergency feeding is impossible to obtain, according to a spokesman for British industry, in a country literally starved for paper. Although wastage of china is enormous, the country is so rich in china clay that the earthenware can be afforded better than paper.

W. C. Hamilton & Sons,
Miquon, Pa., has been awarded the "Job of the Month" citation for September by the Philadelphia Graphic Arts Review. The paper firm received the award in recognition of the typographic design used in its newly published "Hamilton Bond Letterhead Style Book."

Classes on the Use of Paper
by printers were conducted recently for employees of Nekoosa-Edwards Paper Co., Port Edwards, Wis. The five-day session was conducted by Cramer-Krasselt Co., Nekoosa's advertising agency. The discussion subjects covered such items as the use of paper in various printing processes and direct advertising. Printing plants in the area were visited.

Continental Can Co.,
New York, N.Y., has been awarded the bronze "Oscar of Industry" in the Financial World Survey of Annual Reports as having the best annual report in the food containers category. A total of 5,000 annual reports was considered this year in international competition, the eleventh in the series of surveys, and these were judged in 100 industrial classifications for the "Best of Industry" awards. The presentation of the trophy was made October 29 to J. S. Snelham, Continental vice president, at a banquet in New York.

Hiring Physically Handicapped
workers has been cited as important in averting defense manpower shortages by Dechard A. Hulcy, president of the Chamber of Commerce of the United States. The Chamber cooperated with the President's Committee on National Employ the Physically Handicapped Week, which was observed October 8 to 13.

Columbia River Paper Mills
was host to 35 members of the Portland Industrial Chemists Association on September 10. A tour of the Vancouver plant was followed by a banquet at which Al Strang, the firm's chief chemist, gave the principal address.

Lake Superior District Power Co.,
Ashland, Wis., has become a member of Trees for Tomorrow, Inc. G. A. Donald, president of the power firm, has been elected a member of the board of directors of the industry sponsored forestry group. Lake Superior Power owns about 6,000 acres of watershed land in scattered holdings in Wisconsin and Upper Michigan.

An All-time Reforestation Record
is expected during the next planting season by the Southern Pine Association. Last winter and spring approximately 186,600,000 seedlings were distributed by state nurseries. The lumber industry bought nearly 21 per cent of seedling output during 1950-51, the pulp and

paper industry obtained over 27 per cent. In addition, lumber firms planted more than 6,000,000 seedlings grown in company nurseries.

187 Employees of Three Companies in McGraw, N.Y., will share $100,000 left by Fred A. Purchas, who died August 4. The money was bequeathed to employees of Central Box Co., Inc., McGraw Box Co., Inc., and Higgins Supply Co., Inc. Mr. Purchas owned controlling interest in all three concerns. Workers with a year and a half to five years of service will receive $250, those with five to 10 years $500, and those with more than 10 years $1,000.

United Board & Carton Corp. Syracuse, N.Y., has recently announced through its president, William S. Stuhr, a program to increase operational efficiency throughout the firm's eight plants. The new program is planned to increase production, while reducing operating costs.

Hammermill Paper Co., Erie, Pa., recently honored 600 members of the firm's Service Honor Roll at the annual service award ceremony held at Waldameer Park. Veteran Hammermill employees were feted at a luncheon, which was followed by a ceremony honoring nearly 100 men and women who in 1951 observe anniversaries of from 20 to 53 years with the firm.

Flamingo Products, Inc., is a new firm formed in Jacksonville, Fla., to manufacture ice cream cones and paper products such as plates and drinking straws. The company is closely affiliated with Premier Industries, Inc., Covington, Ky.

Exhibition Meeting for Chemical Engineering will be held May 18 to 25, 1952, in Frankfurt, Germany. Special meetings of various European technical associations will be staged in conjunction with the exposition. More than 400 firms are expected to participate.

American Institute of Graphic Arts, New York, N.Y., is planning its 10th annual Printing for Commerce Exhibition. This is a national show of commercial printing selected by an expert jury, and its purpose is to give attention and recognition to excellence in the application of the graphic arts. The Exhibition will open January 14, 1952.

Chicago International Trade Fair is to become a permanent institution. The House of Representatives recently voted to permit all exhibits to enter the country duty free. The first fair, held in 1950, attracted businessmen from 44 nations who exhibited their products. Some 25,000 buyers, in addition to a public attendance of 250,000, were drawn to the exhibition. Dates of the next fair are to be March 22-April 6, 1952.

Central Waxed Paper Co., Chicago, has sold its one-story plant at 5659 W. Taylor St. for $400,000. The firm is moving to a new one-story building of about 160,000 square feet with air-conditioned offices at 5700 W. Roosevelt Rd.

Minnesota & Ontario Paper Co., International Falls, Minn., has granted a two-cent per hour wage boost to 71 employees represented by a CIO plumbers union, the AFL Brotherhood of Firemen and Oilers, and the CIO International Woodworkers of America. The workers covered by the boost were those who were not included in a strike settlement at the plant last month.

Cleveland Container Co., Ogdensburg, N.Y., has granted its workers an increase of 4 cents per hour under a new contract, negotiated by Local 534 of the International Brotherhood of Pulp, Sulphite, and Paper Mill Workers, A.F.L. The union has been bargaining agent for the firm's employees since 1946. Under terms of the new contract, the workers will receive some $3,000 in retroactive pay.

Friedman Bag Co., Los Angeles, has reported that a settlement has been reached in a strike of the International Longshoremen's and Warehousemen's Union. State Conciliator Adolph Koven headed a bargaining session that granted the men an increase of 6½ cents per hour.

Cozier Container Corp., Jefferson, Ohio, has reported that workers at its plant went back to work October 9 after an unauthorized walkout the day before. The union has been negotiating for a wage increase.

Doeskin Products Co., Wilmington, Del., was idle September 22 because of an employee walkout. Approximately 100 on the night shift left their jobs when a strike was called over higher wages and hospitalization benefits.

ELECTRICAL CORD FILLER, composed of soft kraft paper wrapped around a core of Fibreglas yarn, has proved efficient and economical. The new product is manufactured by E. W. Twitchell, Inc., Philadelphia. According to the firm, the filler is less expensive than the conventional product and will effect a savings in fabrication, as it can be made into endless length packages. In addition, it is more uniform in strength and size.

Haskell Made Black-Clawson Executive Vice President

John D. Haskell, general manager of the Dilts Div., has been made executive vice president of Black-Clawson Co., Hamilton, Ohio. In this capacity Mr. Haskell will direct the activities of all divisions and subsidiaries, including the world-wide export organization and B-C International, Ltd. He will retain his headquarters at the Dilts Div. in Fulton, N.Y.

Mr. Haskell's career in the paper industry and allied trades began in 1919, at which time he was employed by Mead Corp. He became associated with Dilts Machine Works, Inc., in the engineering department in 1921. Under his direction the Hydrafiner was developed in 1933, the Classifiner in 1935, and the Hydrapulper in 1939. He was promoted to the position of vice president and general manager in 1936. When Dilts merged with Black-Clawson in 1940 Mr. Haskell was elected a vice president of the parent company, while being retained as general manager of the Dilts Div.

Rice Barton Introduces New Trademark

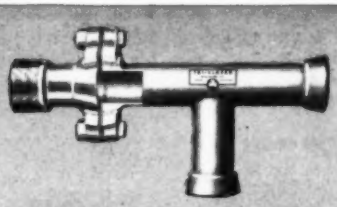
Rice Barton Corp., Worcester, Mass., has introduced a new trademark, which will appear on all the firm's business forms, as well as papermaking equipment. The design is a symbol of rolls and frame, basic components of papermaking machines, while the horizontal line represents the product, paper.

According to an announcement from the 114-year-old firm, the familiar Rice Barton seal will still be used for some

...The COMPLETE Line for ALL CORROSION-RESISTANT piping problems

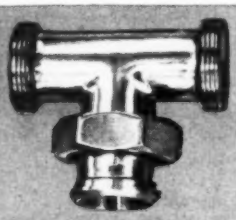
It's TRI-CLOVER

"ZEPHYRWELD"® WELDING FITTINGS ... SS Type 304, 347 and 316—Inconel and other SS analyses. Fabricated in I.P.S. and O.D. Tube Size, ¾ in. thru 24 in.—ells, tees, crosses, flanges, adapters, etc.

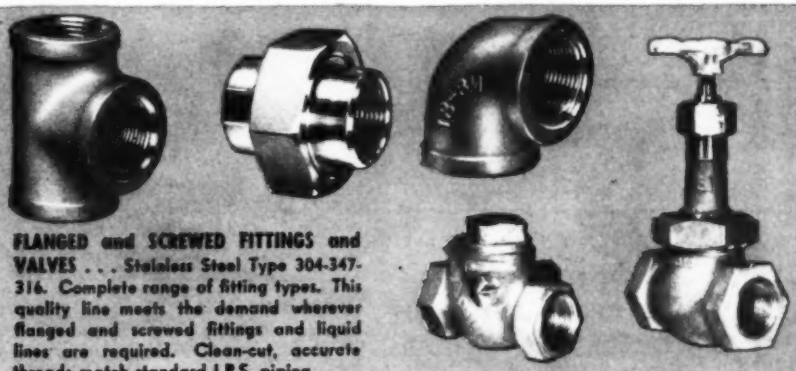


CONICAL END FITTINGS ... Stainless Steel Type 316—Inconel and other SS analyses. Complete line of ells, tees, crosses, laterals, reducers, etc., sizes from 1 in. thru 4 in. O.D. Features: Light weight—low cost—simple, fast installation—leak-tight—flanges of all types for every application—easily adapted to all other fitting types.

RECESSED-END FITTINGS ... Stainless Steel Type 304-347-316. Low cost, light weight fittings designed for fast, simple soldering, brazing or socket welding, in sizes from ¾ in. thru 24 in. Full line of elbows, return bends, tees, crosses, adapters, etc.



"SANITARY" TYPE FITTINGS ... Stainless Steel and Tri-Alloy (Nickel Alloy). Sizes from 1 in. thru 4 in. O.D., in full range of fitting types. Designed and approved as meeting 3A Standards throughout, incorporating numerous exclusive design and construction features.



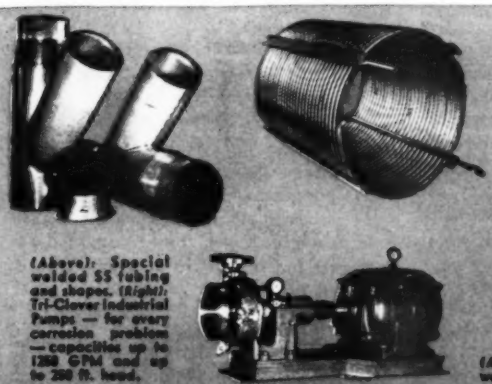
FLANGED and SCREWED FITTINGS and VALVES ... Stainless Steel Type 304-347-316. Complete range of fitting types. This quality line meets the demand wherever flanged and screwed fittings and liquid lines are required. Clean-cut, accurate threads match standard I.P.S. piping.

SPECIALIZED MANUFACTURING FACILITIES

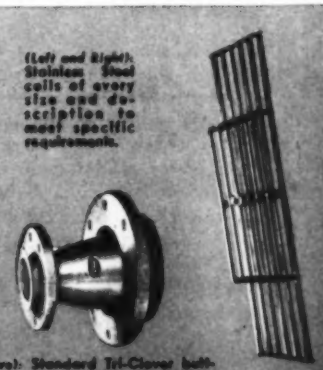
When it comes to expert welding and fabricating of complex assemblies, you just can't beat the speed and accuracy offered with TRI-CLOVER'S exclusive Heli-Arc Atomic Hydrogen Welding... a specialized semi-automatic process that assures highest quality and FULL corrosion resistance. *Shown here are a few typical examples of the wide variety of jobs we handle every day.*

COMPLETE ANNEALING FACILITIES

SWEET DIVISION 8 So. Michigan Ave., Chicago 3, U.S.A.



(Above): Special welded SS tubing and shapes. (Right): Tri-Clover Industrial Pumps — for every corrosion problem — capacities up to 1200 GPM and up to 200 ft. head.



(Left and Right): Stainless Steel coils of every size and description to meet specific requirements.

(Above): Standard Tri-Clover butt-welded fittings furnished in flanged assemblies.

Tri-Clover
MACHINE CO.
Kenosha, Wisconsin

TRI-ALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

THE *Complete* LINE

To: TRI-CLOVER MACHINE CO., Kenosha, Wis.
Send me more information on the following:

- ☐ ZEPHYRWELD Welding Fittings
- ☐ CONICAL END Fittings
- ☐ RECESSED-END Fittings
- ☐ "SANITARY" Type Fittings
- ☐ SCREWED Fittings and Valves
- ☐ PUMPS
- ☐ PIPE and TUBING
- ☐ Custom fabrication of _____ (type of unit)

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

purposes. However, the new insignia fulfills the need for a modern, readily identifiable symbol of Rice Barton equipment.

DeWalt, Inc.
Lancaster, Pa., radial arm saw manufacturing subsidiary of American Machine & Foundry Co., has purchased the complete "Monarch" woodworking machinery line of American Saw Mill Machinery Co., Hackettstown, N.J. The products taken over by DeWalt include a large radial saw, a small radial saw, planer, bench saw, mortiser, jointer, and band saw.

Monsanto Chemical Co.
St. Louis, has announced that its contract to operate Mound Laboratory at Miamisburg, Ohio, and Scioto Laboratory at Marion, Ohio, for the Atomic Energy Commission has been renewed for 4½ years. The laboratories are engaged in highly classified research and development work in atomic energy.

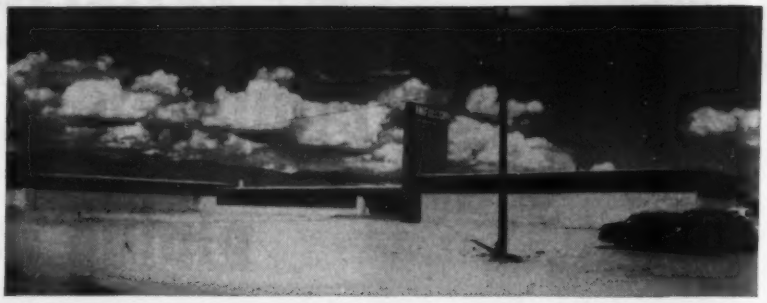
Shartle Bros. Machine Co.,
Middletown, Ohio, has changed the name of its new velocity-type cleaning unit for dirty stock from Hydraclone to Hydrafuge Separator. The unit utilizes centrifiugal force as the means of separating heavier than water material from paper stock.

Stein, Hall & Co.
New York, N.Y., has announced the opening of a new plant for the manufacture of industrial adhesives at Chicago. The plant has 19,000 square feet of floor space and is located at 3750 S. Loomis St. In charge of the Chicago unit is Armond P. Coppola, formerly chemical engineer at the firm's Long Island City, N.Y., plant.

Libbey-Owens-Ford Glass Co.,
Plaskon Div., Toledo, has announced the establishment of a New England office for glues and industrial resins to be located in Boston. The office will cover new and expanded sales territories in New England, New York, and eastern Pennsylvania. Manager of the new branch will be Charles E. Walker, for the past 11 years a technical salesman in the Toledo office.

Link-Belt Co.
Chicago, has opened a factory branch store in Salt Lake City. The new branch will serve Utah, southern Idaho, and eastern Nevada. The office is headed by Donald W. Newsome, an engineer transferred from the firm's San Francisco plant. He is to be assisted by Harry Hotchkiss, formerly of the Spokane, Wash., office.

American Cyanamid Co.
announced recently that it has consolidated its several office and warehouse



ULTRA-MODERN research and executive headquarters building recently completed by Infilco at Tucson, Ariz. The $600,000 structure is set on a 7½-acre plot and includes 40,000 square feet of floor space. It will house modern facilities for the firm's engineering, research and development divisions, as well as the home sales and executive offices

locations in Los Angeles into one newly constructed building at 2300 S. Eastern Ave. Open house ceremonies were held September 27. The new building is a 64,000-square foot structure containing office, laboratory, and storage areas. Sheldon Dahl is the West Coast manager in charge of sales and manufacturing in the Industrial Chemicals and Plastics and Resins Divisions.

Concord Chemical Co.,
Moorestown, N.J., has appointed M. G. Benedict, of Evanston, Ill., as sales representative in Illinois, Indiana, and Wisconsin.

De Laval Steam Turbine Co.,
Trenton, N.J., has completed construction of a new building in San Francisco that will house the West Coast sales and service headquarters, in addition to warehousing facilities.

Hanchett Mfg. Co.
Big Rapids, Mich., was recently host to a 10-man British woodworking team touring U.S. industries under the sponsorship of ECA. The group, which includes leading representatives of management, technical experts, and labor operatives, visited 17 factories throughout the country in the interest of better production efficiency.

Mathieson Chemical Corp.
has purchased Heyden Chemical Corp's 25 per cent holdings in American Potash & Chemical Corp. The transaction involved 134,725 shares of stock. The reported price was $5,389,000.

Arthur D. Little, Inc.
Cambridge, Mass., has opened a Latin American office at Mexico City. The new office will not only serve Latin American clients but will also conduct surveys and investigations for U.S. clients who are interested in industrial and commercial expansion in the region. The office is headed by Richard W. Plummer, who was formerly vice president of E. R. Squibb & Sons de Mexico.

American Bitumuls & Asphalt Co.
San Francisco, is the name given a new company recently formed through the consolidation of American Bitumuls Co. and Stancal Asphalt & Bitumuls Co. The new firm controls the collective manufacture and sales facilities of 14 district offices and factories in the United States and Puerto Rico. AB&A manufactures emulsified asphalts.

Wheelco Instruments Co.
Chicago, has moved its western division sales office to larger quarters at 2320 Milwaukee Ave., Chicago. In addition to being a clearing house for branch office sales activities, the new office will provide sales and service facilities. R. A. Schoenfeld, vice president, is in charge.

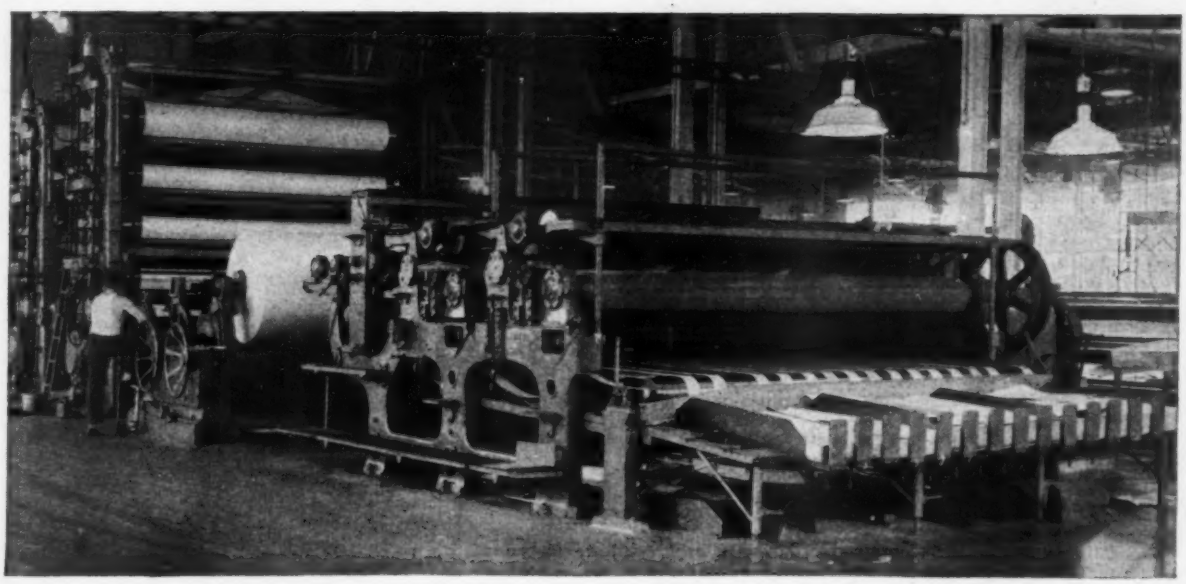
A. O. Smith Corp.,
Milwaukee, has announced the appointment of J. G. Goodwille as industrial safety grating product supervisor. He will develop advertising and sales promotion programs for the firm. The decision to move into the industrial grating field was a logical development, since grating and railroad running boards already manufactured by the firm are made in the same manner.

Howe Scale Co.
Rutland, Vt., has moved the location of its Chicago branch office to 1915 N. Harlem Ave. The new facilities will expand the firm's office and service activities in the Chicago area. Curtis B. Hoffman is the manager in charge.

Whitney Chain Co.,
Hartford, Conn., has announced that its district sales office in San Francisco has moved to new and larger quarters at 70 Dorman Ave. The office is under the direction of George F. Haag.

Conoflow Corp.
Philadelphia, has announced the opening of an auxiliary plant to enlarge its manufacturing facilities in the Philadelphia area. The manufacturer of pneumatic control equipment has leased a two-story building near the main office and factory, which will accommodate the assembly and shipping division.

Extreme accuracy for length and square



The Black-Clawson duplex cutter is a remarkably accurate piece of equipment. Make the required adjustment and sheets will cut to extreme accuracy for length and square.

Heavy, vibrationless construction. Anti-friction bearings for effortless operation.

Revolving and fixed knives heavily trussed to prevent deflection and assure shock-free cutting. Highly sensitive adjustment of stationary knife. Both knives adjustable for squaring of the sheet.

Knives V-belt driven, utilizing heavy fly wheel construction to add extra momentum to cutting action—also to prevent back lash.

Slitter settings quick and accurate. Slitters of shear type to minimize dust accumulation.

Truly accurate cutting for length. Really accurate cutting for square.

Address all inquiries to

BLACK-CLAWSON

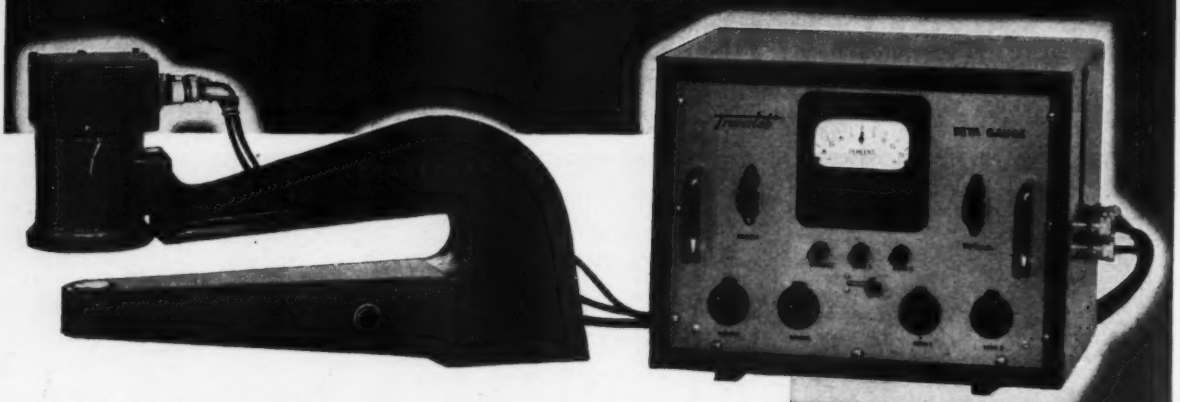
HAMILTON, OHIO

Divisions: SHARTLE BROS. MACHINE CO., Middletown, Ohio
DILTS MACHINE WORKS, Fulton, New York
Western Sales Office: Mayer Bldg., Portland, Oregon
Southern Sales Office: 937 Coventry Road, Decatur, Georgia
Associate: THE ALEXANDER FLECK LIMITED, Ottawa, Canada
Subsidiary: B-C INTERNATIONAL, LTD., Greener House
66/68 Haymarket, London, S. W. 1, England

THICKNESS CONTROL A PROBLEM?

Tracerlab Beta Gauges

CUT COSTS—IMPROVE QUALITY



TRACERLAB's new model, non-contacting Beta Gauge measures and records the weight per unit area or thickness of sheet materials. Because beta radiation is used, a high degree of accuracy and sensitivity is achieved, unaffected by variations in chemical composition of the material being gauged.

Tracerlab developed the first Beta Gauges, and the experience gained through having these instruments in successful, everyday operation in a number of diversified process industries has now been incorporated in a new and outstanding gauge. Featured are simplicity of operation, ruggedness of design and reliability of operation — all combined in an instrument that maintains Tracerlab's established leadership.

The gauge's low cost will be rapidly repaid from raw material savings resulting from closer manufacturing tolerances and faster control, plus a greater uniformity of product with its resulting advantages. A meter showing percentage variation from normal, or a meter calibrated directly in weight or thickness, is standard equipment. Where a continuous record is desired, various types of recorders are available.

For non-contacting gauging of materials accessible only from one side, Tracerlab manufactures a model which operates by measuring "back scattered" beta particles. This gauge is particularly useful in gauging rubber, paper, plastics and other materials as they pass over a calender roll. It has also proved highly effective in measuring thickness of coatings on certain substances.

For complete information, write for Bulletin BG-PI.

Tracerlab
BETA GAUGES
are *NOW* gauging:

CARDBOARD
•
PLASTICS
•
PAPER
•
ADHESIVE TAPE
•
SHEET METAL
•
RUBBER
•
PAPER COATINGS
•
METAL FOIL
•
PLASTIC COATINGS
•
PHOTOGRAPHIC COATINGS
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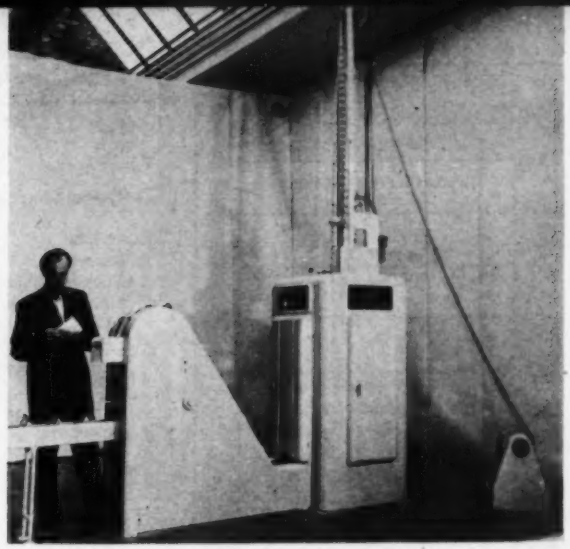
NEW YORK, N. Y.
WASHINGTON, D. C.

TRACERLAB INC., 130 HIGH STREET, BOSTON 10, MASS.

TETRA-PAK recently developed by a Swedish concern for packaging fluids. The easily packed tetrahedrons may be opened on any one of the four corners



PLASTIC-COATED KRAFT PAPER enters the machine from a roll, is formed into a tube, shaped into containers, and filled at rate of ninety per minute. Each unit comes from machine ready for shipment.

New liquid container developed in Sweden

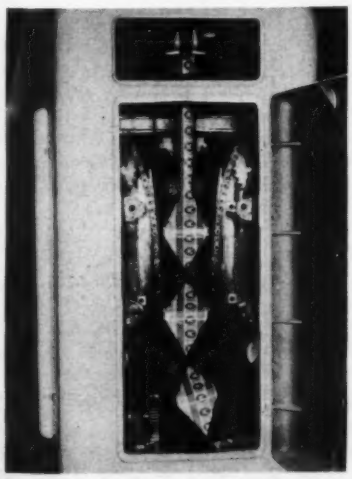
A 65 per cent savings in paper is promised by a recent Swedish development for packaging liquids in one-way containers. The process, announced by Ab. Tetra Pak of Lund, Sweden, utilizes a new design concept for paper cartons.

The container, known as Tetra-Pak, is in the shape of a tetrahedron—a four-sided pyramid where all sides are congruent triangles. The manufacturer has demonstrated that such design saves up to 75 per cent space in shipping and handling. And storage space for empty containers is cut sharply, since they are delivered to the user as a compact roll. With the necessary equipment, the bottler makes his own containers, fills and seals them.

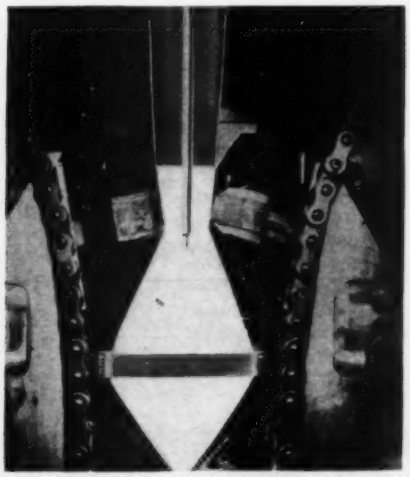
Plastic-coated bleached kraft paper with a basis weight of about 110 lb. per ream (24 x 36—500), is fed from the roll into the specially constructed machine. The paper is shaped into an endless tube and the seam heatsealed. During a continuous movement downward the tube is pressed together at regular spaces by pairs of heatsealing irons, or jaws, operating at right angles to each other. At the same time, the liquid is pumped into the container through a supply pipe around which the paper tube has been formed.

The tube leaves the forming and filling machine as a garland of tetrahedrons. The filled and sealed containers are then separated from each other by a built-in cutter. The units are packed automatically in hexagonal containers, which they fill completely, for shipment. The weight of the machine is approximately 1,200 lb.

Liquids that have been packaged by the new process include milk, cream, automobile oil, fruit juices, and other uncarbonized fluids.

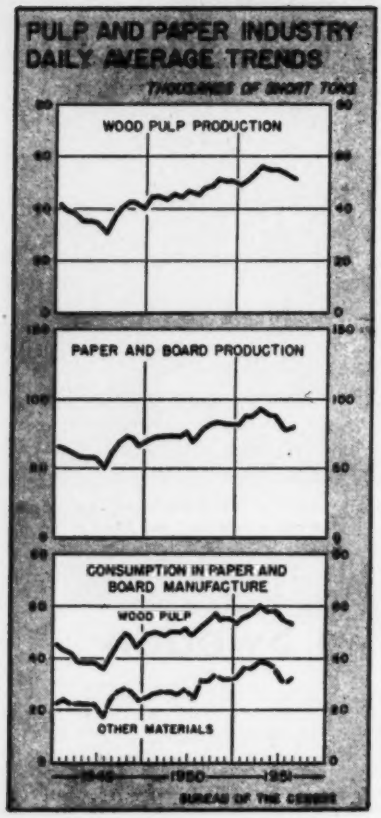


CHAIN - MOUNTED HEATSEALING JAWS seal the tube at regular distances, first in one direction and then in the other. This forms a garland of tetrahedron containers which are filled, then fed to the cutting unit, where they are separated.



FLUID ENTERS THE CONTAINER being formed through a pipe extending down through the tube from above. The level of the liquid is maintained above the seal being pressed and above the nozzle outlet; surplus liquid is forced up into the next container; foaming is prevented

SPACE SAVING — Neatly packed containers demonstrate the space-saving design of the Tetra Pak. The shipping container is hexagonal and can be stacked for transport with no lost space



U. S. Paper and Paperboard Production

	Aug. 1951 (tons)	July 1951 (tons)	Aug. 1950 (tons)	Total 1950 (1,000 tons)	Total 1945 (1,000 tons)
Paper and Board, total	2,206,570	1,996,444	2,194,168	24,300	17,371
Paper, total	991,539	873,651	926,648	10,679	7,574
Newsprint	97,151	89,873	88,413	1,017	725
Groundwood paper (uncoated)	67,038	57,846	62,766	694	636
Printing and converting (coated)	97,305	83,838	90,758	1,015	1,501*
Book paper (uncoated)	139,784	112,698	132,156	1,577	
Fine paper (writing, cover and text, bristols, thin paper and other)	116,142	95,741	111,874	1,223	1,001
Coarse paper (unbleached kraft, glassine, grease-proof, vegetable parchment and other)	303,584	277,523	287,079	3,383	2,403
Special industrial paper	35,143	30,501	26,481	316	238
Sanitary paper	105,935	100,453	95,411	1,108	824
Tissue paper	20,560	17,938	22,406	241	157
Absorbent paper	8,897	7,240	9,304	105	89
Paperboard, total	977,663	894,254	997,378	10,804	7,907
Container board, total	534,039	508,733	520,419	5,646	4,131
Liners	357,308	343,033	338,423	3,690	
Corrugating material	148,718	141,135	151,705	1,637	
Container chip	28,013	24,565	30,291	320	
Bending board (folding boxboard)	280,952	242,091	†	2,368	2,092
Nonbending board (set-up box board)	63,003	55,810	†	641	721
Cardboard	7,554	4,766	7,721	77	71
All other paperboard	92,115	82,854	189,516	2,071	891
Wet machine board	12,047	8,817	13,524	144	112
Construction paper and board, total	225,321	219,722	256,618	2,673	1,778
Building paper and insulation	112,777	100,822	136,408	1,414	883
Hardboard and insulating board	112,544	118,900	120,210	1,259	895

(*) Total for 1945, combining printing and converting paper and book paper. (†) Data not available due to revision of classifications.
Source: U. S. Department of Commerce.

August Pulp, Paper and Board Production

Paper and board production during August stood at 2,206,570 tons, only slightly above the 2,194,168 tons produced in August 1950. According to the Department of Commerce, the industry operated at 79 per cent of base capacity.

Pulpwood receipts at the mills were 2,718,584 cords during August. Consumption at 2,288,905 cords was less than receipts, resulting in a month-end inventory increase to 4,821,060 cords.

Wood pulp production was 1,415,183 tons. In terms of production base capacity, pulp production ran at 86 per cent, with sulphate pulp being produced at 90 per cent.

Wood pulp inventories at the end of August at the mills increased 5 per cent to 506,706 tons from the 482,429 tons reported at the end of July. Month-end stocks at pulp mills decreased about 7 per cent to 100,345 tons.

South Leads Nation in Pulpwood Production

The South now produces 60 per cent of the total yearly U.S. cut of pulpwood and leads all other regions in mill capacity necessary for converting the raw wood into pulp. This was revealed recently in a report released jointly by the U.S. Forest Service experiment stations in New Orleans and Asheville.

Pulpwood cut in the South during 1950 hit an all-time high of 12,500,000 cords, topping by at least a million cords the previous record year of 1948. Total U.S. cut in 1950 was 21,000,000 cords.

Leading southern producer is Georgia, whose 1950 harvest of 2,200,000 cords comprised 18 per cent of the South's and 11 per cent of the nation's cut. Mississippi ranked second with 1,700,000 cords; Florida and Alabama were next with about 1,300,000 cords each. Other million-cord states were North and South Carolina and Virginia. Nine-tenths of the pulpwood being cut is pine, but production of hardwood is increasing from year to year.

Sixty-one pulp mills are now in operation in the South, with a total daily capacity of 22,800 tons. Louisiana's eight mills lead with a total daily capacity of 4,000 tons; Georgia follows with 3,300 tons, while Florida ranks third with 3,100 tons. The accompanying table lists the southern production figures.

Southern Pulpwood Production

State	No. of mills	Capacity (tons)	Production (1000 cords) 1948	1949	1950
Alabama	7	1,869	982	911	1,321
Arkansas	2	810	617	561	604
Florida	8	3,140	1,221	1,036	1,385
Georgia	7	3,260	1,771	1,791	2,221
Louisiana	8	4,040	954	760	883
Mississippi	6	2,087	1,434	1,168	1,666
North Carolina	4	1,708	926	802	1,024
Oklahoma	0	———	34	38	39
South Carolina	3	2,322	1,108	1,012	1,183
Tennessee	4	358	182	158	144
Texas	2	970	824	791	922
Virginia	10	2,273	1,306	895	1,044
Total	61	22,837	11,359	9,923	12,436

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1851-1951

100 Years of Service

100 YEARS is a large sector of time. Back in 1851 when Charles Morningstar, grandfather of Joseph Morningstar, present head of Morningstar, Nicol, Inc., founded the company, the California Gold Rush was at its height; Millard Fillmore was President of the United States, Daniel Webster was Secretary of State. Henry Clay's effort toward the admission of New Mexico and Utah as Territories had just succeeded. From a humble beginning, so long ago, the Morningstar Company has grown until it now has operations in 20 states. Especially rapid progress and expansion has occurred during the past decade. In addition to the domestic sales and manufacturing activities, Morningstar, Nicol, Inc. also imports Tapioca Flour from Brazil, Arrowroot from the West Indies, as well as Starches and Tropical Gums. You will find us keenly alert to every opportunity to render a valuable service to the Paper Field.

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Let Our Paper Department Experts Give You Valuable Aid On . .

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4. LAMINATING ADHESIVES
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Morningstar's modern laboratory and manufacturing facilities are now ready to give far more effective aid to the Paper Industry! Our enlarged Paper Department is now under the supervision of Mr. Jerome P. (Jerry) Strasser who is directing the development and application of our Starch Specialties and Adhesives for the paper trade. Mr. Strasser, together with MNI Laboratory and Technical Field Men can lend you highly effective and valuable aid on your Dextrine, Starch and Adhesive problems. Without obligation, write TODAY! Ask for suggestions, ideas, samples and cost estimates on your needs. Get all the advantages which only MNI's extensive experience and facilities can give.

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OLIVER

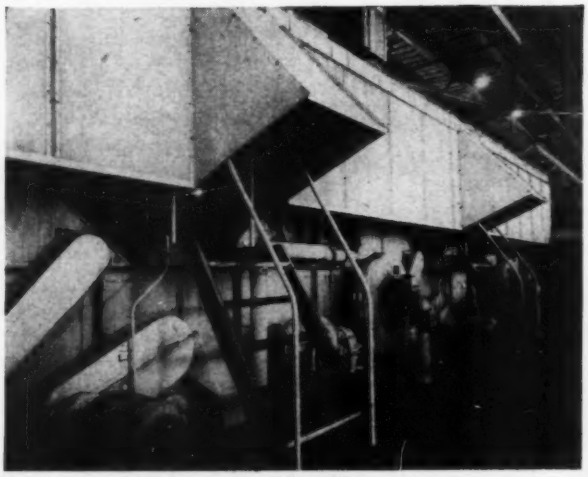
"Ringvalves"

. . . that led to a record-breaking order

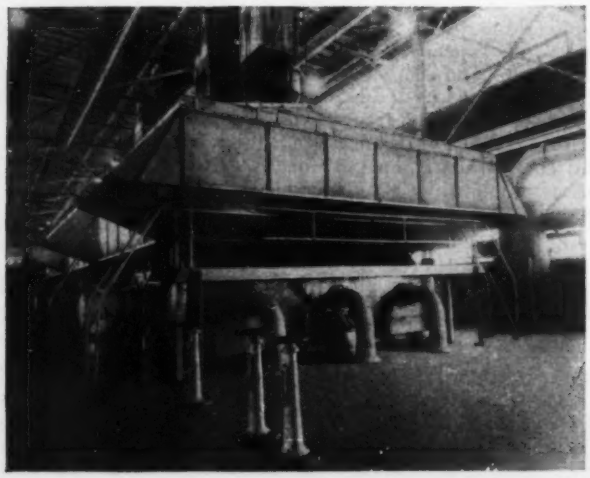
A year or so ago we announced an order for 16 Oliver Ringvalve Filters from a paper company operating in the South. This was the largest single order for "Ringvalves" ever placed and, certainly, one of the largest single orders for *any* type of pulp and paper mill filters ever placed anywhere. In every respect, it was a record order.

Now, along comes a bigger order from the same company for 17 Oliver Ringvalve Filters, consisting of Brown Stock Washers, Bleach Washers and Deckers.

The most important feature is not the size of the order — interesting as that may be — but what brought it about. Those placing this order had been operating "Ringvalves" for several years and endorsed them. They liked particularly the inherent *plus* capacity in Ringvalves always available when the production pressure is on. They liked its satisfactory washing, regardless of tonnage handled. So, when plans for a new mill were being drawn up, the choice was the Oliver Ringvalve Filter for all operations where is would properly fit.

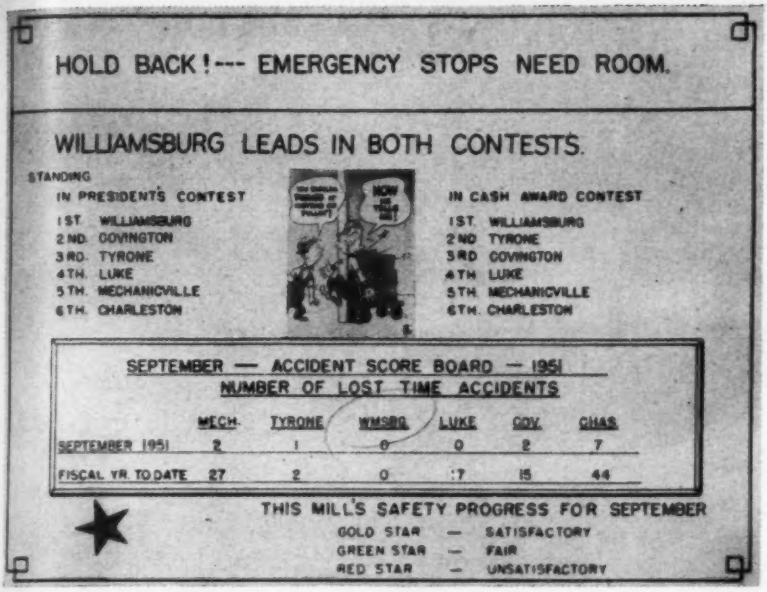


Three Brownstock Washers — Drive Side.

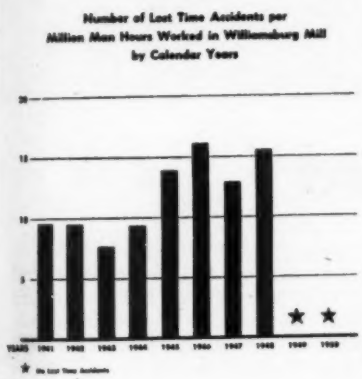


Three Ringvalve Brownstock Washers — Feed End.

Could you ask for any stronger testimonial? When a company lives for some time with a piece of equipment doing vitally important work and then can say "This is what we want for our new mill" . . . that equipment must be right! Certainly, it must be satisfactory! Being satisfactory and being right is the main reason why the Oliver Ringvalve Filter — 17 units in all — is going into the company's new mill and why it has gone into so many other mills. Including this record-breaking order, the total Ringvalves now in service or under construction runs well over one-hundred-and-fifty.



Foster emphasizes intra-plant safety competitions



was the two-year mark, and now is the industry record.

The 1950 record at Williamsburg, following adoption of changes in the safety program, contrasts sharply with safety accomplishments in the years immediately preceding 1949 (the first full year of the .00 accident rate). In 1948 the plant's accident frequency rate was 15.48; in 1947, it was 12.98, and in 1946 it was 16.01. The average rate for the past five years is 8.89.

Scope of Operations

The 1950 continuation of the no lost-time accident record, which has been carried into its 28th month, was realized during a year of full and uninterrupted operations. The mill is on a continuous shift basis, seven days a week. During 1950 the plant operated a total of 365 days at nearly full capacity. The installation is a self-contained pulp and paper mill with a daily rated capacity of 75 tons of pulp and 80 tons of paper. In 1950 it produced 24,442 tons of pulp and 28,237 tons of paper, with 91.7 per cent of the entire working staff engaged in production and maintenance.

At the close of 1950 the safety record of each department at Williamsburg were as follows: outside, 755 days, 281,270 man-hours; pulp, 769 days, 168,752 man-hours; machine room, 823 days, 244,431 man-hours; recovery, 863 days, 188,997 man-hours; calender, 867 days, 131,784 man-hours; finishing, 882 days, 302,526 man-hours; beaters and drainers, 1,022 days, 155,344 man-hours; cutter room, 1,176 days, 188,160 man-hours; mechanics and welders, 1,192 days, 163,304 man-hours; office and supervision, 1,520 days, 530,480 man-hours; electrical, 1,645 days, 65,800 man-hours; pipe, 1,750 days, 99,750 man-hours; paint, 1,750 days, 70,000 man-hours; laboratory and coating, 1,856 days, 400,896 man-hours, and power, 2,049 days, 239,733 man-hours. The plant as a whole had continued its .00 accident frequency rate over 755 days and 2,076,905 man-hours since its last lost-time accident.

While operations at Williamsburg are extensive and varied—including the power department, outside department, pulp mill, paper mill, recovery, maintenance and repair, several conditions increased the usual hazard. The ground at the plant was frozen solid for a longer period during 1950 than usual. Approximately 15 per cent of the employees have outside jobs.

A new chipper was installed during the contest year. The installation required considerable blasting. That, naturally, increased the safety hazard. So did the subsequent transition period, while the workers were becoming fully accustomed to the new installation.

Another transition period further increased the safety hazard. In October 1950 the plant's wood handling operation was shifted from a manual to a mechanical basis, with the addition to plant equipment of a tractor crane, which again required a period of retraining and readjustment.

History of Safety Program

In the years before the second World War the working force was stable, with little labor turnover. Although the committee charged with devising a safety program was untrained, with its efforts geared principally toward the correction of faulty mechanical conditions, the program was fairly successful. The labor force was comprised of seasoned employees. This expertness of the force, combined with the elimination of some major hazards, resulted in satisfactory accident reduction. Thus there was little incentive to introduce many changes into the program.

The war years saw a depletion of the working force and the need for a program of greater scope. New employees received thorough instruction in safety methods; more and better safety equipment was made available; first-aid facilities were expanded; a full-time nurse was on the job, and a certain amount of safety literature was included in the program. Accident frequency rates were more satisfactory than before the war. However, the program regressed immediately after the war.

Then came the 1947 reorganization, with complete employee participation. A committee was appointed to include an equal number of supervisory and hourly paid employees. Union and management cooperation was secured.

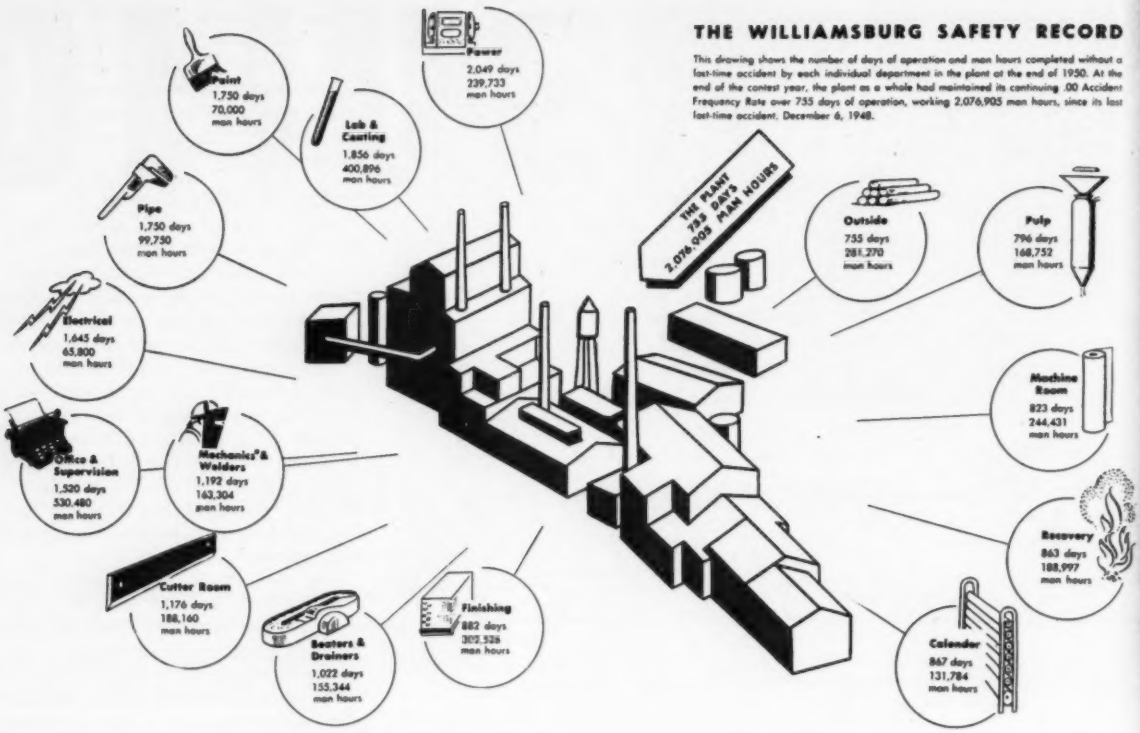
In 1948 the program was strengthened by the adoption of the Lateiner Method of Accident Control. This method launched a long-range program to determine the particular types of human as well as mechanical failure which caused most of the accidents, followed by a short-range program attacking the specific accident causes revealed in the early study.

Under this plan the mill began to classify accidents by unsafe acts and conditions, which enabled the committee to concentrate its accident-prevention efforts in areas of recurrent causes. Strong emphasis was placed on the individual responsibility of each supervisor for safety education and implementation of the program within his area of jurisdiction.

This new phase of the program immediately began to show substantial results, and to it goes a large part of the credit for the mill's current no lost-time accident run.

How the Program Functions

The safety committee carries out a continuous program of safety training


THE WILLIAMSBURG SAFETY RECORD
This drawing shows the number of days of operation and man hours completed without a lost-time accident by each individual department in the plant at the end of 1950. At the end of the contest year, the plant as a whole had maintained its continuing .00 Accident Frequency Rate over 755 days of operation, working 2,076,905 man hours, since its last lost-time accident, December 6, 1948.
THE PLANT 755 DAYS 2,076,905 MAN HOURS
Power 2,049 days 239,733 man hours
Paint 1,750 days 70,000 man hours
Lab & Casting 1,856 days 400,896 man hours
Pipe 1,750 days 99,750 man hours
Electrical 1,645 days 65,800 man hours
Office & Supervision 1,520 days 530,480 man hours
Mechanics & Welders 1,192 days 163,304 man hours
Cutter Room 1,176 days 188,160 man hours
Beaters & Drainers 1,022 days 155,344 man hours
Finishing 882 days 302,526 man hours
Outside 755 days 281,270 man hours
Pulp 796 days 168,752 man hours
Machine Room 823 days 244,431 man hours
Recovery 863 days 188,997 man hours
Calender 867 days 131,784 man hours

Paper Industry Safety Award

pation backed by cooperative support from both management and union. Its effectiveness is shown by the improvement in plant efficiency and production figures for the contest year. The number of pounds of paper produced per operating hour rose from 72 in 1949 to 76 in 1950. The efficiency of the plant's pulp mill rose from a rating of 78.2 per cent in 1949 to 89.93 per cent last year, while the efficiency rating of the pulp mill shows 96.7 per cent for 1950 as against 91.9 a year earlier.

Human Element Emphasized

The Williamsburg safety record results from several developments. Following a reorganization of the safety program in 1947 and the adoption of the Lateiner Method of accident control in 1948, the emphasis had been shifted from the correction of mechanical conditions to the human element. The new program was given considerable impetus by the development of an intra-mill safety competition, which has been conducted for many years among the plant's 15 departments. This contest is based on the safety record of each department, with the monthly results being posted on bulletin boards throughout the mill. The individual departments set their sights on day-to-day operation with a perfect record. Since some departments, because of size, number of employees and operational hazards, found it easier to achieve the daily goal than did others, the contest found more interest among employees in departments with the best records. However, early in 1949 the mill manager promised an official banquet for every Williamsburg employee if the entire mill completed the next six months without a lost-time accident. Thus the day-to-day no-accident goal, which had been targeted in some departments only, became a mill-wide goal. With the first six-month goal achieved, the target became the company record of 238 days, held by the plant at Tyrone, Pa. After realizing that standard, the sights were raised to one full year, the next target

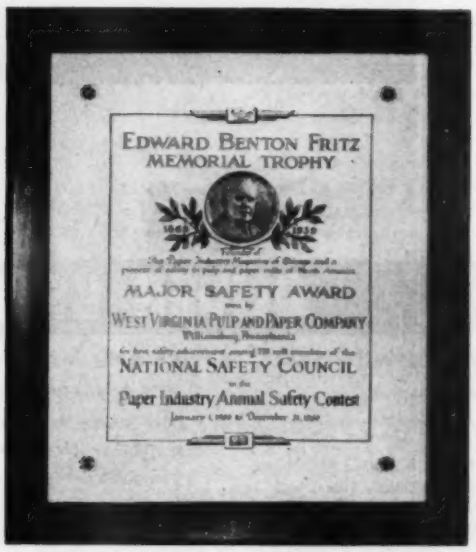
J. W. Schultz, J. W. Lewis, Ray Orris and John Fluke of the West Virginia Williamsburg mill look over their prize

West Virginia Pulp & Paper Receives

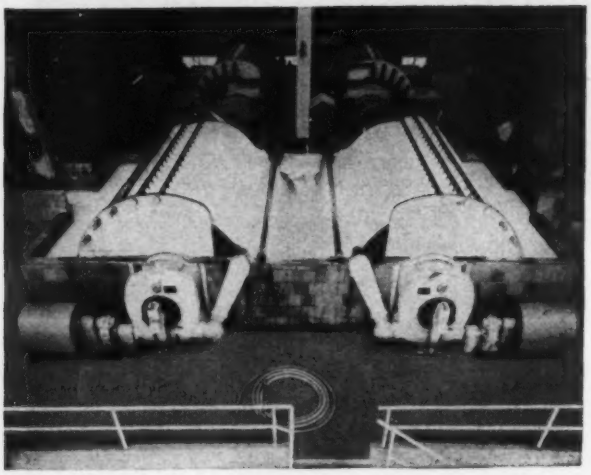
For attaining well over two years of accident-free operation, the Williamsburg, Pa., plant of West Virginia Pulp & Paper Co. has been awarded the Edward Benton Fritz Memorial Trophy, presented each year by THE PAPER INDUSTRY in cooperation with the National Safety Council as the grand prize for the best achievement in the paper industry safety contest. As of March 16, the no-accident record covered 829 days, or 2,296,728 man-hours. Representatives of the Williamsburg plant accepted the trophy during the recent National Safety Congress in Chicago.

Between January 1 and December 31, 1950, the period covered by the contest, an average of 471 employees worked 997,868 man-hours without a single lost-time accident. The mill management has set as the goal the industry record of 3,343,598 man-hours, held by Hollingsworth & Whitney Co., Waterville, Me. The last lost-time accident at Williamsburg occurred December 6, 1948.

Behind the Williamsburg record is a program of individual employee partici-



Ray Orris, West Virginia safety director receives plaque from A. Scott Dowd, president of Fritz Publications, Inc., Chicago



Bleached Pulp Ringvalve Deckers in foreground (rubber covered, stainless fittings); Unbleached Pulp Deckers in rear (steel with stainless steel fittings).

The Oliver Ringvalve Filter, unique in design among *all* pulp mill filters, offers the following advantages:

1 . . . Each unit can do either single or two-stage washing.

2 . . . Multi-stage washing plus re-washing can be done on fewer units.

3 . . . Because of these combined operations, pulp is handled less frequently; less pumping and accessory equipment are required.

4 . . . Permits operation with more dilute feed in vat thus promoting more uniform and better sheet formation; hence, better washing.

5 . . . Central drainage quickly frees section of liquid thus helping to form uniform sheet.

6 . . . Central location of the valve, directly under the sections, provides minimum time lag resulting in better separation of wash liquor.

7 . . . Barometric leg operation.

In addition to the 17 Oliver Ringvalve Filters ordered for the new mill, the company is buying a standard 8 x 12 pipe type Oliver Saveall with tile vat, similar to the unit illustrated above. This unit is rubber covered with stainless steel fittings.

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AUSTRALIA
Hobart Duff Pty., Ltd.
Melbourne

SOUTH AFRICA
E. L. Bateman Pty., Ltd.
Johannesburg, Transvaal

for all employees, with special emphasis on training supervisory personnel. Regular meetings, demonstrations, and first-aid sessions are held for all employees. Safety indoctrination for each new employee is an important phase of the program.

In the event of an accident, the supervisor in charge makes an investigation, followed by a complete report of the circumstances, including an analysis of the cause or causes, and submits it promptly to the plant committee. Suggestions for remedial measures are made by the committee, and it is then the responsibility of the supervisor to see that those suggestions are carried out. If the accident is especially serious, the committee is organized to conduct an on-the-spot investigation. A complete file is kept on all accidents and is analyzed periodically to determine the causes of the most frequent accidents.

Unsafe conditions are systematically eliminated through study by the committee. If the situation is departmental, the committee instructs the supervisor concerned to explain the details of correction to his men. If the condition is mill-wide, the explanation of correction is given to all employees.

Members of the Mill Inspection Committee carry out monthly inspections of all departments for unsafe conditions and hazardous operations. The committee report is submitted to the committee as a whole and, if approved, to the mill manager. Another sub-committee checks weekly to guard against fire hazards.

The West Virginia firm sponsors two incentive contests among its six mills during each fiscal year. In the President's Safety Contest a plaque is awarded annually to the mill that makes the greatest improvement in its accident frequency rate over its previous five-year average. A Cash Award Contest offers an annual prize of $100 to the mill with the lowest frequency rate for the current contest year.

What West Virginia's People say about Safety

J. Lynne Ferner, Mill Manager

"The West Virginia Pulp & Paper Co. has always been safety conscious. Although our mills are operated on a departmentalized basis, the top management of the company has long encouraged, through the New York personnel offices, active safety programs in all mills. Good examples of this are the two company-wide contests sponsored by the firm, the President's Trophy and the cash award contest.

"Further than that, the New York personnel office keeps each mill informed as to its standing in all company and national contests. Information concerning lost-time accidents in the mills, their causes and the corrective measures taken are also circulated by this office. In addition, they frequently offer suggestions for the improvement of mill safety programs and make possible conferences at which mutual problems are discussed.

"At the mill level the success of our program has been the result of an effective organization and teamwork. By an effective organization I mean not only a safety committee, but every employee of the mill at all levels—from common labor to top management. Every employee has done his part to make this organization a smoothly functioning team. While the relative position of any one employee on this team might seem unimportant, it is the unity of purpose manifested by each one which has brought about our results. Without this unity of purpose and safety consciousness of each employee, the success of our safety program would not have been possible. At any time during the period in which we were establishing our present perfect safety record any employee could have ruined it by a single unsafe act."

—J. LYNNE FERNER, Mill manager

John C. Fluke

Ray L. Orris

"Our increase in production with a corresponding decrease in cost per ton during the past two and one-half years proves conclusively to us that an accident-free plant affects to a very large extent the quality of a product and quantity of production. In other words, safety and production are so closely integrated together that without one you cannot have the other. Consequently, a good accident-prevention program is a must if we expect to meet the present day competition and provide job security for our employees. The other important objective of safety work is the elimination of human suffering and financial hardships incurred by employees who have serious injuries. It goes without saying that the operation of our plant during the preceding 1059 days without a disabling injury gives us a feeling of satisfaction that each and every employee has made his or her contribution toward the attainment of the two most important objectives of a safety program."

—JOHN C. FLUKE, Personnel manager
—RAY L. ORRIS, Safety director

Paul Wilkinson

C. W. Patterson

"We in the paper mill feel that good housekeeping and safety go hand in hand. We attribute our safety record to the wholehearted interest and cooperation of top management, the safety suggestions of the men, and the constant building up of safety consciousness in each and every person in the organization. Efforts expended in developing safety consciousness have actually helped to increase production and to improve quality. Many of the factors that cause accidents also result in inefficient operation. It stands to reason, then, that elimination of conditions and attitudes that cause accidents will help increase efficiency. Our record here at Williamsburg proves this is true."

—PAUL WILKINSON, Paper mill supt.
Member safety committee

"The value of our safety program to the employees can be defined in various ways. From a financial viewpoint, the value consists of a savings of money to both the employees and the company. From an economic viewpoint, the program has resulted in increased production and higher quality. But from the most important of all viewpoints, the human viewpoint, the safety program has its greatest value. The sorrow and pain that accompany accidents cannot be measured in terms of money. Neither can the inner satisfaction of accomplishment that we at this mill have attained be recorded in dollars and cents."

—C. W. PATTERSON, Woodyard supt.
Member safety committee

C. J. Lang

E. B. Lytle

J. W. Lewis

J. W. Schultz

"Our safety program is well organized, and the employees are all interested in it to the extent that their cooperation is freely given when asked for, or suggested on the items and problems that arise from one day to another. This feeling between the employees and the safety committee is due to the interest shown by the committee in trying to make our jobs safer and easier.

"As a result, our employees are interested in the program to such an extent that they are very observing and cautious, thereby reducing the number of injuries. When an employee is injured he knows the importance of first-aid and reports it to the dispensary to prevent further complications.

"The value of the safety program cannot be measured in dollars and cents entirely but the number of accidents has been reduced and that means less pain and financial problems for all employees."

—CARL J. LANG, Maintenance and Construction Supt.

"I feel that the present safety program has enlightened everyone, from top management down, and shown them that 'Safety Really Pays.' It has shown that having regular men on the job at all times makes for a smoother running organization. To me the safety of each man means that he will be able to be on the job, do his best, and take home his regular pay.

"It is very evident in the record that has been achieved that each man 'Feels Safety,' not merely says it. Instead of leaving safety up to others, each man realized the dangers of his job and has done something about them to make safety work. When the men realize the importance of safety it isn't as hard for a supervisor to do his job toward making and maintaining a safe place to work. Through the program the committee has been able to bring 'Safety' to the men and the men have seen that through eliminating unsafe practices and unsafe conditions they can eliminate injury to themselves and others."

—ED. B. LYTLE, Pulpmill foreman

"Several years back our safety record was poor. One year we had 17 lost-time accidents. At this time management and the union sat down together and decided that a new program should be instituted. A committee of Ray Orris, present safety director; John Fluke, personnel manager; W. E. Losse, an hourly employee, and myself were appointed to set up a new safety program. However, this was by no means a cure-all. The next year we had 12 lost-time accidents.

"Benefitting by our mistakes of the prior year, we again made some necessary changes. During this next year we had two lost-time accidents, with the last one on December 6, 1948. We found during this time that our method of safety suggestions had to be changed. Our original set-up called for the use of safety suggestion forms. Employees were afraid that by filling these out that possibly the foreman might hold this against them. Safety suggestions are now given orally to any member of the safety committee and they in turn bring them up without any mention of who made the suggestion.

"After some trial and error in an educational program, we hit upon a safety publication. We gave this bulletin out with the pay checks, then people were contacted and asked questions concerning the bulletin. If they could answer properly, they were given a silver dollar. Such things, along with the fact that the hazardous and unsafe equipment and places were corrected rather rapidly, has given us the wholehearted cooperation of the employees. Without this no safety program can be successful. Our mill manager has always given credit to the men and has also expedited all safety suggestions and the over all program in general whenever possible. We have now set our goal as establishing a new record of man-hours exposure without a lost-time accident in the paper industry."

—JAMES W. LEWIS, Coating Dept. operator; Vice Chairman, Safety committee; President Local 677, UPA, CIO

"Our safety program has been a success because of three main factors: (1) Management has given splendid cooperation to the safety committee; (2) employees have given the committee wholehearted cooperation and have made it possible to attain the record we now have through the use of common sense in regards to safety, and (3) the committee as a whole has been cooperative and has worked together as a good team under the able leadership of the safety director.

"Putting all three of the above mentioned together, we have proven conclusively, as shown by our present record, that a good job in regards to safety can be done, and we can continue to do a good job.

"Winning the Edward Benton Fritz Trophy was a great honor for all of us at the Williamsburg Mill, but the fact that we have operated 1059 days without a lost time accident is without a doubt a greater reward for our efforts."

—JAMES W. SCHULTZ, Colorman, Beater room, Member safety committee

Diana Lockevich

A. J. Kifer

"The safety program means more to me than just a contest. In Williamsburg it has fundamentally meant the reduction of suffering, which is an immeasurable reward to all of us. The promotion of this program shows the company's interest in the safety and welfare of its employees. This interest has basically been responsible for us achieving our present safety record."

—DIANA E. LOCKEVICH, Counter, finishing room

"Our safety record proves that our program is on a sound basis. It takes full cooperation between management, the safety committee, and the employees to have an outstanding record, as we have here at West Virginia Pulp & Paper Co."

—A. J. KIFER, Screen room operator

E. M. Campbell

C. A. Morgan

"Safety is a part of our work at the mill and in the home. Our safety program has been set up and organized under the following subjects: (1) Cooperation; (2) education; (3) accident-prevention by inspection, and (4) acci-

dent-prevention by elimination of hazards.

"Cooperation is a big factor toward the success of a safety program. By cooperation of management, foremen and hourly employees, we have established what I think is a good safety standard. In our safety program our first step was to educate the members of the safety committee. By cooperation from the foreman, we are trying to educate the other employees. Safety education is stressed strongly to the new employees. Accident-prevention by inspection is conducted monthly throughout the mill."

—E. M. CAMPBELL, Pipe Dept., Member safety committee

"I feel that safety is as important as production. Along with the fact that the employee's safety has been stressed, (since his life is much more important than production) production has been increased. One thing that has received much attention is good housekeeping, and anyone working on a paper machine knows that that is important. Our safety record has been accomplished due to the cooperation of management and employees. It requires both of these to assure any ultimate goal. One or the other alone could not succeed."

—C. A. MORGAN, Paper Machine back tender

History of the Paper Industry Trophy

Twenty-seven years ago the first Major Trophy given in the contest among mill members of the Pulp and Paper Section of the National Safety Council was awarded by THE PAPER INDUSTRY magazine to the Nekoosa-Edwards Paper Co., Port Edwards, Wis. This contest lasted but one month. The succeeding contest ran for eight months; thereafter for six months until 1932 when the contests were extended to a full year. Since 1932, the awards have been given for a twelve-month record.

In 1939, THE PAPER INDUSTRY Major Trophy became the Edward Benton Fritz Memorial Trophy, awarded by Fritz Publications, Inc., publisher of THE PAPER INDUSTRY.

Twenty-seven major trophies awarded since 1925 have been won by the following mills:

Nekoosa-Edwards Paper Company, Port Edwards, Wisconsin
Kimberly-Clark Corporation, Neenah, Wisconsin
International Paper Company, Riley, Maine
St. Croix Paper Company, Woodland, Me.
Kimberly-Clark Corporation, Niagara Falls, New York
The Crystal Tissue Company, Middletown, Ohio
The Champion Coated Paper Company, Hamilton, Ohio
Cornell Wood Products Company, Cornell, Wisconsin
St. Croix Paper Company, Woodland, Me.
St. Croix Paper Company, Woodland, Me.
St. Croix Paper Company, Woodland, Me.
Hollingsworth & Whitney Company, Waterville, Maine
Bird & Son, Inc., Philipsdale, Rhode Island
Anglo-Canadian Pulp & Paper Mills, Ltd., Quebec
Anglo-Canadian Pulp & Paper Mills, Ltd., Quebec
Strathmore Paper Company, Woronoco, Massachusetts
The Mead Corporation, Nashville, Tennessee
U. S. Gypsum Company, North Kansas City, Missouri
The Flintkote Company (Pioneer Div.) Los Angeles
The Flintkote Company (Pioneer Div.) Los Angeles
Marathon Corporation, Ashland, Wisconsin
Kimberly-Clark Corporation, Niagara, Wisconsin
Strathmore Paper Company, Woronoco, Massachusetts
Container Corporation of America, Carthage, Indiana
West Virginia Pulp and Paper Company, Tyrone, Pennsylvania
National Container Corp., (K. P. & B. Div.) Jacksonville, Fla.
West Virginia Pulp and Paper Company, Williamsburg, Pennsylvania

Hand paper-making demonstrated at London exhibition

Paper-making by hand was among the industrial handcraft displays shown in the Power and Production Building of the Festival of Britain South Bank Exhibition held last summer. Britain has now been making paper for some five centuries. She still excels in the production of hand-made paper of high quality, and in this part of the Exhibition, visitors could watch many of the fascinating processes. In the background of the display a map shows how the art of paper-making found its way to Europe from its birthplace in China, where paper-making began in the first century, A.D. By 751 it had reached Samarkand. Forty years later it was being practised in Baghdad. From Egypt in the 10th century it came by two separate routes into Europe. England was making paper by 1495.

Cotton and linen rags are the basis of this hand-made paper. After sorting they are boiled and bleached, mixed with water and beaten in a hollander to separate the fibres. The "stuff", as it is called, then passes to the stuff-chest, where the pulp is kept in suspension by a mechanical agitator which maintains the mixture at the right consistency.

As the pulp leaves the chest it flows through a mechanical strainer. At this point the "stuff"—a milky suspension of fibres in water—becomes visible as it is shaken through the fine slits of the strainer, which hold back any rough lumps of fibre or foreign bodies.

The fluid now passes to an open vat where the vat-man is standing with his mould which resembles a shallow frame with a fine wire mesh. Up to this point the process takes care of itself, largely by mechanical means, but with the vat-

man personal skill enters into the story. He places on the mould a shallow frame or "dekle." Then, with a characteristic motion of the hands and forearms he dips the mould into the vat and lifts it out again. As he does so the water drains through the mesh bottom of the mould, leaving a thin sheet of residue behind. The action, which produces in effect a sheet of wet paper, looks ridiculously simple, yet in it is embodied much of the art of paper-making. The manipulation of the mould, which takes place while the water is draining away, calls for skill and long practice.

It is during this process that the embryo sheet receives its water mark. If the fine mesh of the fould is examined—and some examples are included in the exhibit—a design will be found embossed upon its surface. The impress of this on the wet fibres imparts the characteristic water-mark.

The next process, couching, consists of transferring the wet sheet to a square of woolen felt. Turning the mould face downwards, the coucher transfers each wet sheet to a woolen felt by pressure and repeats the operation until he has built up a "post" of wet sheets and felts in alternate layers.

At the next stage the post of sheets and felts is transferred to a press which squeezes out much of the remaining water. The contents of the press then pass to the "layer" who separates the damp sheets from the felt. This calls for careful handling as he lays them in a neat pile in preparation for drying. At this point the product resembles damp blotting paper. The remainder of the process, which is not shown in this feature, consists of sizing to fill up the pores and render the paper ink-resisting, then finishing the surface and tearing into "deckle-edged" sheets.

Paper Mill Power—Part VII

The paper mill boiler plant

DAVID MOFFAT MYERS
Myers & Addington, New York

SMALLER PAPER MILLS sometimes find that it does not pay to generate electric power, even though no additional fuel would be consumed by a modern balanced power plant. The labor and capital charges alone per kilowatt-hour would render the return on the investment unattractive. Such a paper mill can economize by using direct steam drives for its paper machines, and perhaps jordans, and for such other equipment as to bring about a steam balance between mechanical power and process steam from the exhaust of the driving units.

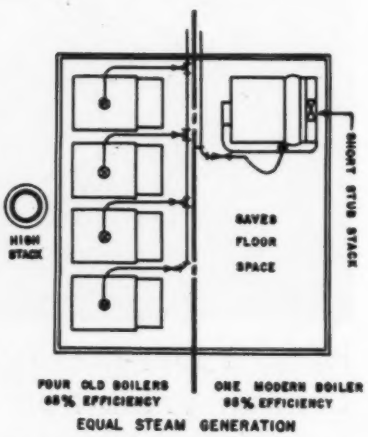
Practically all other paper mills should generate electrical energy with an efficient and well-balanced power plant.

In either case, except in the very rare instance in which sufficiently cheap steam can be purchased, a boiler plant is most definitely required.

It is estimated from surveys that of all the boilers operating in industries, some 33 per cent are 30 to 40 years old and 50 per cent are 20 years old. Since an old, inefficient boiler may consume each year two to three times its cost in fuel and maintenance, its replacement should be immediately considered.

Old boilers of the kind I have in mind may normally be giving an efficiency in the range of 60 to 70 per cent, as compared to a modern unit with an efficiency of 84 to 88 per cent.

A single new boiler of present-day design may usually replace from two to



Increased efficiency and saving of floor space result from replacing old boilers with a single new unit

five of the old-type units, with large savings in floor space, cost of attendance, and maintenance which together with the important fuel savings comprise a self-liquidating investment. When it is remembered that the cost of coal and the cost of labor today are about three times what they were twenty-five or thirty years ago, the above statement will be recognized as conservative.

It can often be arranged to retain some of the old boilers as standby for a few years, thus deferring the balance of the total investment, while at the same time putting into immediate effect the bulk of potential savings.

The question of the most economical pressure for the new boiler has been treated in previous articles. Even when no electric power is to be generated, mechanical power generation such as by direct steam drives for paper machines should be considered and steam pressure must be determined by the same thermodynamic principles and methods.

When analysis shows the need of future power generation, high-pressure boilers can be installed to deliver lower pressure steam temporarily. They can then later serve turbine units for the generation of cheap by-product power.

Along with the development of modern high-pressure boilers, there has been evolved a science and practice of feedwater conditioning necessary to their safe and efficient operation, as well as for protection of the steam turbines. To reduce the cost of water treatment and plant, it is good economy to provide for return to the boilers of all the pure condensate possible.

The new boiler should be designed with a furnace and combustion equipment capable of burning efficiently as many fuels interchangeably as may be available in the local market. Such provision provides against production stoppage due to shortage of any one fuel. Due to the deteriorating quality of today's coal supply, the combustion arrangements should be conservatively designed if that fuel is to be burned in the future.

In paper mills producing their own pulp, wet bark is available as a waste fuel. In its primary wet state, it is far from an ideal fuel. When mixed with sufficient saw dust or "hog feed" excellent efficiency is attainable. Generally speaking, however, although some furnace designs are good, the results as a whole are very indifferent, leaving much that could be accomplished by suitable study and research.

In kraft pulp mills, where black liquor is burned for recovery of chemicals, special boiler units for the purpose have been developed for high-pressure steam generation at excellent efficiency. In a well designed plant, enough steam can be thus generated to supply the pulp production requirements.

While planning and waiting for the new boilers, it is generally possible to improve the efficiency of the old ones. A ten to fifteen per cent gain can often be obtained by virtue of thorough cleaning and conditioning of the unit, combined with modern methods of combustion control and daily check on efficiency by means of suitable instrumentation.

Such improvement, however, has its limitations, and the time comes in every plant when a sound and forward-looking program must be prepared on the basis of a thorough analysis of the specific conditions and requirements of each individual case.

Paper and paperboard making—XIX

HARRY WILLIAMSON

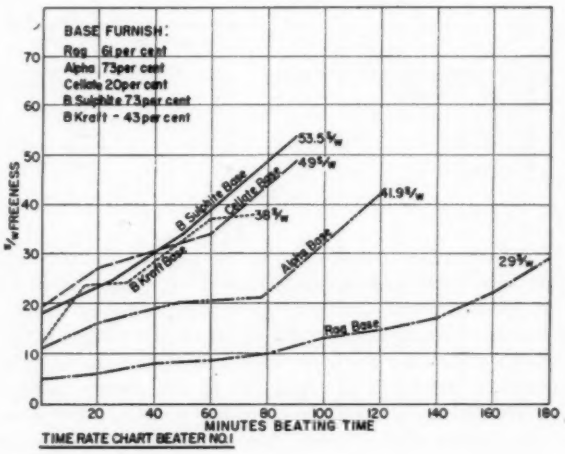
Beater Operation Studies—Part 4

In previous installments, we have presented five separate studies of work done by the beaters on five separate furnishes. Now, to continue this study of beater room operations, this report contains:

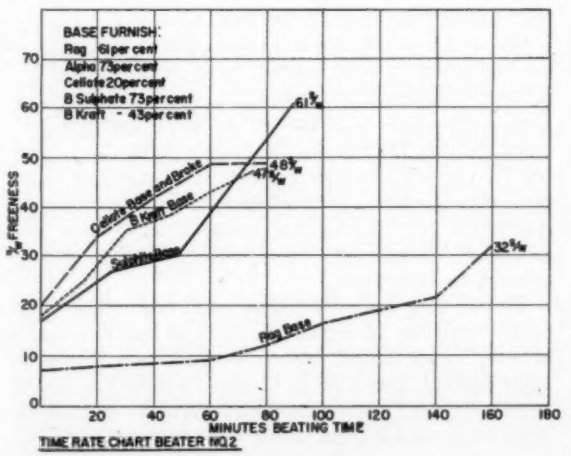
(1) Five *Time Rate* charts, one for each beater. Each chart shows the work of each beater on the five furnishes in *time rate of work done* and *degree of work done* as measured by S/W freeness. These charts are a compilation in handy form of the efficiency rate of each beater on each type of furnish.

(2) Tables and CONTROL charts showing adjustment of time rate of work for each beater on each of the selected furnishes. These control charts are so arranged that a major percentage change in BASE furnish may be readily computed in time rate of required work to develop the desired freeness. Recommendations have been calculated from the total data assembled from all charts.

(3) Recommendations on when and in what proportion to most safely dump the broke beater. Broke should always be dropped in conjunction with the *least* efficient beaters; NEVER in conjunction with a *fast* developing beater.



TIME RATE CHART BEATER NO.1



TIME RATE CHART BEATER NO.2

Beating time

It is of the utmost importance to develop the BASE furnish in EACH beater charge to a more nearly equal degree of hydration.

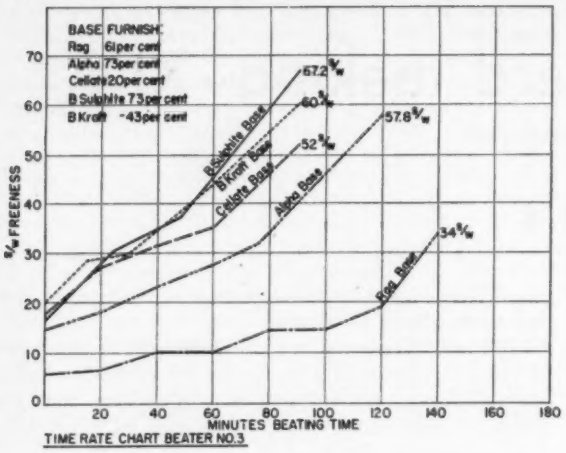
This is the colloid which, amongst other important factors, provides the COLLOIDAL AFFINITY for the *even* retention of fines.

See control chart for proposed arrangement of TIME

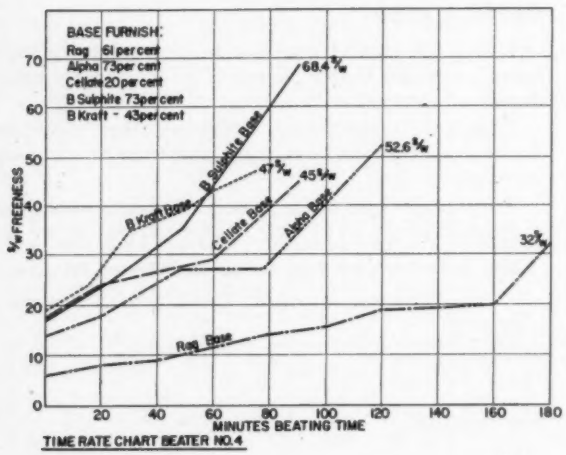
Time Rate Table for Each Beater on Different Furnishes

	Rag	Alpha	Cellate	B.Kraft	Sulphite
Per cent of base furnish	100	73	77	43	73
Initial Freeness	6	14.4	18	20	17
No. 5 Beater					
Total Degrees S/W	44	57.9	52	59	74.7
Total Minutes	140	120	90	75	90
Min. Per Degree S/W	3.181	2.758	2.667	1.923	1.560
No. 3 Beater					
Total Degrees S/W	34	57.8	52	60	67.2
Total Minutes	140	120	90	75	90
Min. Per Degree S/W	4.117	2.765	2.647	1.875	1.792
No. 2 Beater					
Total Degrees S/W	32	On Broke		47	61.0
Total Minutes	160			75	90
Min. Per Degree S/W	5.00			2.777	2.043
No. 4 Beater					
Total Degrees S/W	32	52.6	45	47	68.4
Total Minutes	180	120	90	75	90
Min. Per Degree S/W	5.625	3.149	3.333	4.687	1.744
No. 1 Beater					
Total Degrees S/W	29	41.9	49	38	53.5
Total Minutes	180	120	90	75	90
Min. Per Degree S/W	6.206	4.363	2.903	4.150	2.465

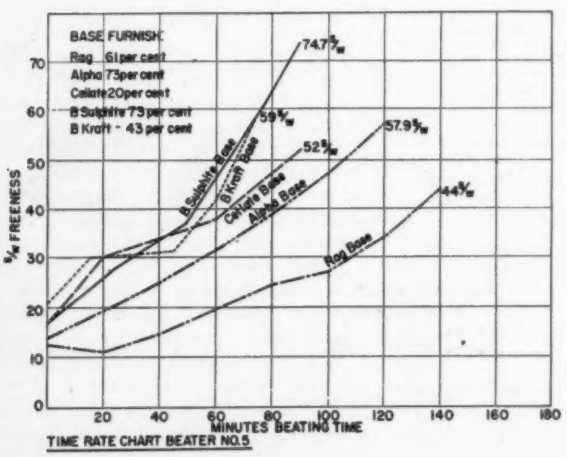
Each of the five beaters on five different base furnishes. "Base Furnish" equals the strong fiber which requires most beating.



TIME RATE CHART BEATER NO. 3



TIME RATE CHART BEATER NO. 4



TIME RATE CHART BEATER NO. 5

for the different proportions of base furnish. When establishing a NEW proportion, or using pulp obtained from a NEW source of supply, the original run SHOULD be check tested at even periods of TIME as was done in the five furnish studies. This is the *foundation* of EVEN VALUES in the finished sheet of paper.

This is PLANNED CAUSE to desired EFFECT. Testing at the end of the paper machine is RECORDING of EFFECT. It is AFTER the event.

Table A—Alpha Base Furnish
(Superfine Cover 112½ lb.)

	Base Furnish 37 S/W	Total Furnish 58 S/W
Minimum beating time required	75 min.	120 min.
For No. 5 Beater	75 "	120 "
For No. 3 "	90 "	120 "
For No. 2 "	100 "	125 "
For No. 4 "	115 "	135 "
For No. 1 "	115 "	135 "

Table B—Cellate and Forshage Base Furnish
(Union Bond Papers)

	Base Furnish 36 S/W	Total Furnish 52 S/W
Minimum beating time required	60 min.	90 min.
For No. 5 Beater	60 "	90 "
For No. 3 "	60 "	90 "
For No. 2 "	70 "	90 "
For No. 4 "	90 "	110 "
For No. 1 "	80 "	110 "

Table C—Bleached Craft Base Furnish
(Ledger Papers)

	Base Furnish 31 S/W	Total Furnish 59 S/W
Minimum beating time required	20 min.	75 min.
For No. 5 Beater	20 "	75 "
For No. 3 "	20 "	75 "
For No. 2 "	40 "	90 "
For No. 4 "	40 "	90 "
For No. 1 "	45 "	90 "

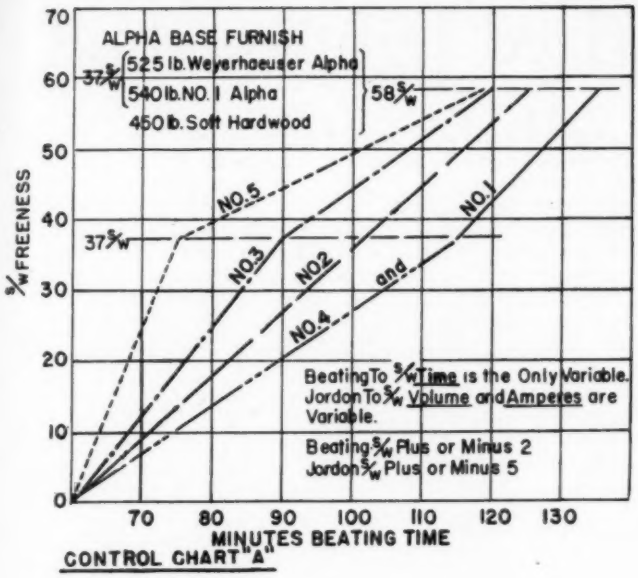
Table D—Forshage Sulphite Base Furnish
(Heavy Weight Cover Papers)

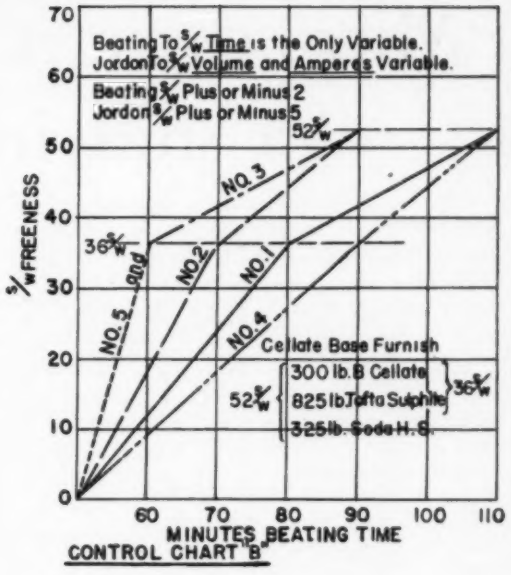
	Base Furnish 36 S/W	Total Furnish 75 S/W
Minimum beating time required	45 min.	90 min.
For No. 5 Beater	45 "	90 "
For No. 3 "	45 "	90 "
For No. 2 "	65 "	100 "
For No. 4 "	60 "	90 "
For No. 1 "	60 "	90 "

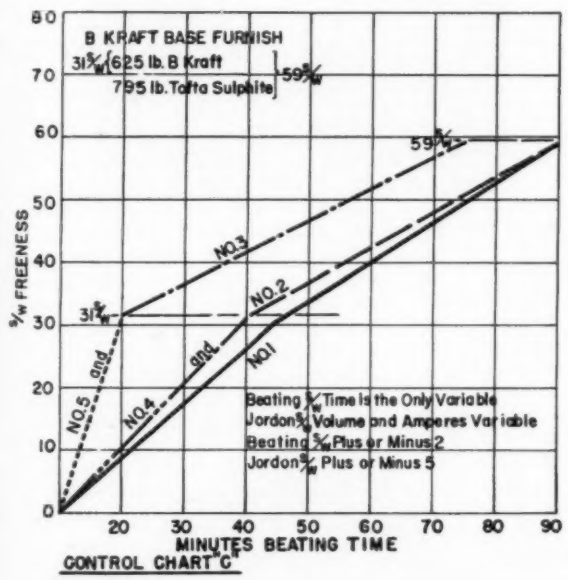
The mechanical devices of the paper machine such as slice control, shake control and vacuum control are at the service of the machine tender to adjust in ratio to the changes which may occur in the values of the stock delivered to him from the beater room. The BETTER the stock is regulated at the *source* the less machine changes he has to make and the more *even* the quality of the paper. Also regulation of the stock more nearly equalizes the interpretive experience of the different machine tenders; perfection would mean "felt minder" instead of machine tender.

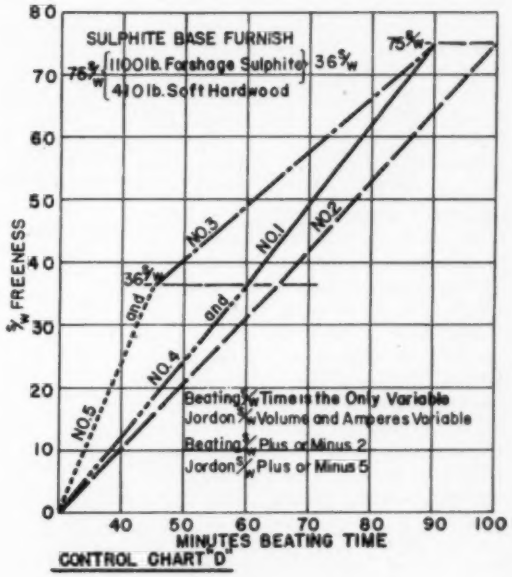
Using the operating machine wire as a testing device is COSTLY: It is subject to trial and error; it is subject to difference of opinion and subsequent action; it is evidence of lack of reasoned application of basic FACTS. Therefore, close up the bracket of potential human error by *control*. The changes recommended in beating proportion time will increase production and will increase quality. They will most materially reduce loss by rejection, sorting costs and rebates to customers.

Examples: Four furnishes selected, wood fibers only. Based on the data obtained in the five furnish studies, rag included. Tables A, B, C and D together with control charts A, B, C and D show the beating time required (on base and total furnish) for different beaters to develop the same final freeness.









Broke beater

All the evidence of the data collected shows that "broke" should NEVER be dumped immediately after No. 5 or No. 3 beaters.

Two-thirds of a broke beater should be dumped immediately following No. 1 and one-third immediately after No. 4 for kraft, Cellate and Alpha base furnishes. For Sulphite base furnishes the "broke" should be dumped half a beater at a time immediately following No. 1 and No. 4.

Failure to observe this will only mean more broke.

These time brackets will more nearly regularize the amount of work done. As the furnish becomes weaker, the beaters of course develop the TOTAL furnish much more evenly and there is very little need to increase the total time. It is the work done on the base furnish that is most important.

The in-put hp. should be maintained at full load for each beater all the beating time. The consistency of all furnishes should be made even. The ONLY variable should be TIME and then there is less confusion. Beaters should be beaten off to S/W test both for base and total furnish. These tests can be established on each run of each furnish. Succeeding runs are then tested towards the end of each established bracket of time only to check if the current pulp being used is harder or softer, necessitating less or more time.

Extremely hard furnishes, such as Rag or Alpha, should be beaten off in groups of three or four beaters to a test so that the mixture of all three or four will give the required test. This practice, even with a big reserve chest, is DANGEROUS on wood fibers of less pure Alpha content because the freeness developed is in the Slow Zone.

Microscopic polarized light method for studying cellulose fibers

Significance of the color effects in the microscopical method for determining the arrangement of the cellulose crystallites

GEORGE J. RITTER*
Forest Products Laboratory

A RAPID MICROSCOPICAL-polarized light method has been developed making it possible to determine how fibers or ray cells, separated from wood, will shrink during drying from a water-saturated to an oven-dry condition. The method is based on the principle that the doubly refractive property of cellulose crystallites in the fibers and ray cells modifies the two parts of a beam of polarized light during its passage through the cellulose crystallites. The modification interferes with the rate of travel of the two parts of the polarized-light beam.

From the color effects produced it is possible to determine rapidly the arrangement of the long slender cellulose crystallites in a cellulose specimen and in turn predict how the specimen will shrink during drying from a water-saturated to an oven-dry condition.

The shrinkage properties of fibers and ray cells as determined by the microscopical polarized-light method have been related to the shrinkage of wood in its three principal directions; namely, longitudinal, radial, and tangential.

Wood, unless quite cross-grained, shrinks exceedingly little, less than 1.0 percent, in the longitudinal direction. On the other hand, shrinkage of the wood in the radial direction (horizontally from the heart of the tree in a straight line to its circumference) is of considerable magnitude. And shrinkage of the wood in the tangential direction (horizontally and at right angles to the radii of the tree) is approximately 1½ to 2 times that in the radial direction. Available data show that longleaf pine on the average shrinks 4.8 per cent radially and 7.5 per cent tangentially; rock elm shrinks 5.1 per cent radially and 9.9 per cent tangentially.

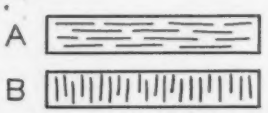
A satisfactory explanation for nonshrinkage of the material longitudinally has been given on the basis that the wood fibers do not shrink lengthwise and, since they are arranged parallel to the longitudinal axis of the tree, the wood should not shrink longitudinally. On the other hand, the reason as to why wood shrinks less radially than tangentially involves complications.

In one explanation, which has been used with no confirming experimental results, the explainers blame the ray cells for the discrepancy between the two shrinkages. The explanation follows a 3-step pattern: (1) Fibers do not shrink lengthwise, (2) Ray cells are fibers and likewise do not shrink lengthwise, (3) Therefore, since the ray cells are arranged with their long axis in the radial direction of the tree and do not shrink lengthwise, they restrain radial shrinkage of the wood.

Microscopical polarized-light experiments performed on fibers and ray cells separated from wood show that premise (2) and conclusion (3) of the above explanation are in error.

By means of the microscopical polarized-light method, it is shown that the long slender cellulose crystallites in the fibers are arranged lengthwise, as in specimen A. When the water is withdrawn from between the crystallites, they will move sidewise to fill the gap from which the water withdrew. As a result, the cellulose specimen will shrink crosswise and become thinner, as do fibers.

In contrast, the crystallites of ray cells separated from wood according to the microscopical polarized-light method are arranged, in general, crosswise, as in specimen B. When this specimen drys, the crystallites will move toward one another at right angles to their long axis. Thus, most of its shrinkage will be lengthwise.



As a result of the lengthwise shrinkage of the ray cells, they should have no restraining effect on the radial shrinkage of the wood, since they are arranged with their long axis in the radial direction of the wood structure.

The results from the microscopical polarized-light method on the shrinkage of fibers and ray cells, which in turn affects the shrinkage of wood, have been confirmed by X-ray data, by actual shrinkage measurements during the drying of wet isolated fibers and ray cells, and by shrinkage measurements of wood specimens before and after the ray cells were removed from the wood.

Microscopical studies

In a previous publication, (1) microscopical data were presented on the orientation of the cellulose crystallites in the fibers and the ray cells of wood. From the results the authors concluded that the ray cells, unlike the fibers, shorten considerably lengthwise during drying, which is contrary to the then prevailing concept. Further, the claim that the percentage of radial shrinkage of wood is less than that of the tangential shrinkage because of a restraining action by the ray cells was also shown to be in error.

The major objective of the present paper is to determine the orientation of the cellulose crystallites in the fibers and the ray cells of wood microscopically in a polarized light system. It was accomplished by furnishing additional microscopical data on the orientation of the indices of refraction planes in the fibers and the ray cells and x-ray data on the orientation of the cellulose crystallites in the ray cells; and by correlating the microscopical and the x-ray data so as to show how the planes of the indices of refraction are arranged in the cellulose crystallites of both the fibers and the ray cells.

Arrangement of crystallites

Fundamental information on the arrangement of the cellulose crystallites in the principal structural elements (fibers and ray cells) of wood is required for understanding the unsymmetrical dimensional changes the material undergoes during the sorption of moisture in the range between fiber saturation and oven-dry conditions. Although cellulose crystallites are submicroscopic in dimensions they, nevertheless, have optical properties that are microscopically measurable. The properties, when correlated with x-ray data, are microscopically usable for determining the crystallite arrangement in cellulose specimens.

Cellulose crystallites are doubly refractive. This property leads to the production of color effects in cellulose specimens when observed in polarized light. If a beam of polarized light (light vibrating in a single plane) enters a doubly refractive crystal it is resolved into two components that vibrate in

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*The author, a chemist at the Forest Products Laboratory for many years, has retired since this paper was written. The Forest Products Laboratory, Forest Service, U.S. Department of Agriculture, is maintained at Madison, Wisconsin, in cooperation with the University of Wisconsin.

Plate 2—Optical effects produced on polarized light by the cellulose crystallites of cellulose fibers and ray cells arranged in series with a first-order red selenite plate

A—two cellulose fibers crossed at 90 deg.

B—same specimen as *A* rotated 90 deg.

C—cellulose ray cells arranged at 90 deg.

D—same specimen as C rotated 90 deg.

planes arranged at 90 deg. to one another. One component vibrates in the plane of the low-refractive index of the crystal; the other component vibrates in the plane of the high-refractive index. The two components travel parallel with one another and in the same direction. The component vibrating in the plane of the high-refractive index travels slower than the other component; it will accordingly emerge from the doubly refractive crystal subsequently to other components.

Henceforth in this article the component that vibrates in the plane of the high-refractive index will be designated as the slow component; the one that vibrates in the plane of low-refractive index will be designated as the fast component. Moreover, the plane in which the slow component vibrates will be known as the slow-vibration plane and, conversely, the plane in which the fast component vibrates will be known as the fast-vibration plane.

Retardation

During the passage of light through a doubly refractive crystal the retardation in the rate of the slow component as compared with that of the fast component varies with the difference between the two indices of refraction and with the thickness of the specimen. Thus, if the difference between the two refractive indices of the crystal is slight, the retardation or lag of the slow component behind the fast component will be small; conversely, if the difference between the two indices of refraction is large the retardation of the slow component will be large. The retardation can also be increased by increasing the thickness of the doubly refractive specimens. This means of changing the retardation and of producing the attendant color effects will be illustrated by data presented in plates 1 and 2. On plate 2 an arrow in connection with each specimen indicates the orientation of the high refractive index of the selenite plate.

Lag in the rate of the slow component causes interference between the two components, if they are made to vibrate in the same plane. Under these conditions color effects are produced. The color that is produced depends on the lag of the slow component and is expressed in retardation numbers 1, 2, 3, 4, —etc., corresponding respectively to the colors: 1 gray, 2 light gray, 3 white, 4 yellow, 5 orange, 6 red, 7 violet, 8 blue, 9 green, 10 yellow, 11 orange, 12 red. The first six colors comprise the first order, and the last six, the second order of the color chart.

Color effects

The color of a single delignified fiber or a ray cell between Nicol prisms crossed at 90 deg. is, in general, between the gray and the white, if oriented at either of its maximum brightness positions. These positions are at approximately 45 degrees to the axis of the two Nicol prisms as shown by the fibers crossed at 90 deg. in plate 1-A. Thus, the lag of the slow-light components coming through the under fiber will be two retardations behind the fast-light component. While passing through the upper fiber, however, the slow-light component will overtake the fast-light component because it will vibrate in the fast-vibration plane, whereas the fast component will vibrate in the slow vibration plane of the upper fiber. The net result of passing through the two fibers will be a neutralization or blackout at the crossing of the fibers. A similar effect is shown at the overlapping of two ray cells in plate 1-B.

Increased contrast in the color effects can be produced by inserting into the optical system a selenite plate in series with the cellulose specimen. The results so obtained in polarized light can be correlated with x-ray data to determine microscopically the arrangement of the refractive index planes in the cellulose crystallites. Thus the blue color of one fiber in plate 2-A indicates that the high-refractive index plane of the cellulose crystallites is parallel with the high-refractive index plane of the selenite plate.

This arrangement produces the addition of the two retardations of the fiber and the six retardations of the selenite plate, and results in the eight retardations, which produces blue. The fiber in the preceding arrangement was oriented with its long axis parallel to the high-refractive index plane of the selenite plate. Accordingly the high-refractive index plane of the crystallites is arranged lengthwise in the fiber. X-ray data show that the crystallites, in general, are also arranged lengthwise in the fibers. (2) Therefore the high-refractive index plane is parallel to the lengthwise axis of the crystallites.

The yellow-colored fiber crossing the blue fiber at 90 deg. is arranged at 90 deg. to the high-refractive index plane of the selenite plate. Its yellow color is due to the subtraction of the two retardations, light gray, of the fiber from the six retardations, red of the selenite plate, leaving the four retardations, yellow as in plate 2-A.

When the microscope stage was rotated 90 deg. the colors of the two fibers reversed as in plate 2-B, thus indicating sameness in the crystallite orientation of the two fibers. Further the plus 2 retardations of the fiber involved to produce the blue color and the minus 2 retardations of the fiber involved to produce the yellow color neutralize one another so that the red color of the selenite plate remains at the crossing of the fibers. When the microscope stage is rotated 90 deg. the fiber colors reverse as in plate 2-B but the color at the crossing of the fibers is red as should be.

On the other hand, ray cells that were light gray between crossed Nicol prisms produced the additive effect, blue, in series with a selenite plate in polarized light when their long axis was crosswise to the high-refractive index plane of the selenite plate. They produced the subtractive color, yellow, when their long axis was parallel with the high-refractive index plane of the selenite plate as in plate 2-C. Thus, their high-refractive index plane is crosswise in the specimens.

When the microscope stage was rotated 90 deg., the color or the ray cells reversed. This indicates sameness of the crystalline arrangement of the two ray cells as indicated in plate 2-D. X-ray diffraction data indicate that the crystallites are also arranged crosswise in the ray cells (3). Therefore the high-refractive index plane is parallel to the lengthwise direction of the crystallites of the ray cells, the same as in the crystallites of the fibers. Thus, the orientation of the crystallites in the ray cells can also be determined microscopically.

A similarity as to the lengthwise orientation of the high-refractive index plane in the crystallites of both the fibers and the ray cells has been pointed out. With this information as a basis, it is possible by microtechnique to arrange a fiber and a ray cell in relative positions to one another so as to produce resultant optical effects confirming the conclusion that the crystallites are arranged, in general, lengthwise in the fiber and crosswise in the ray cell.

As shown in plate 1-A, two fibers having the same retardation color, for example light gray, if crossed at 90 deg. in polarized light neutralize the optical effects of one another. They, thus, produce a blackout of the crossing. Accordingly a ray cell having the same retardation color as that of a fiber should produce a blackout if it is mounted on the fiber in the lengthwise direction as shown in plate 1-C.

This plate shows the effect of the thickness of the specimen on the retardation of the slow component and the attendant color. Thus, two ray cells on the fiber in the plate 1-C overlap slightly and thereby make up four retardation colors at the small superimposed area. Thus, plus 2 retardations and minus 4 retardations produce minus 2 retardations or light gray. This light gray is the same as that of the single ray cells outside the area of the fiber.

Plate 2-E shows the same specimen as that in plate 1-C but a selenite plate has been inserted into the optical system to produce the 6-retardations, that is, the red color of the background. An additive 2-retardation fiber is superimposed on

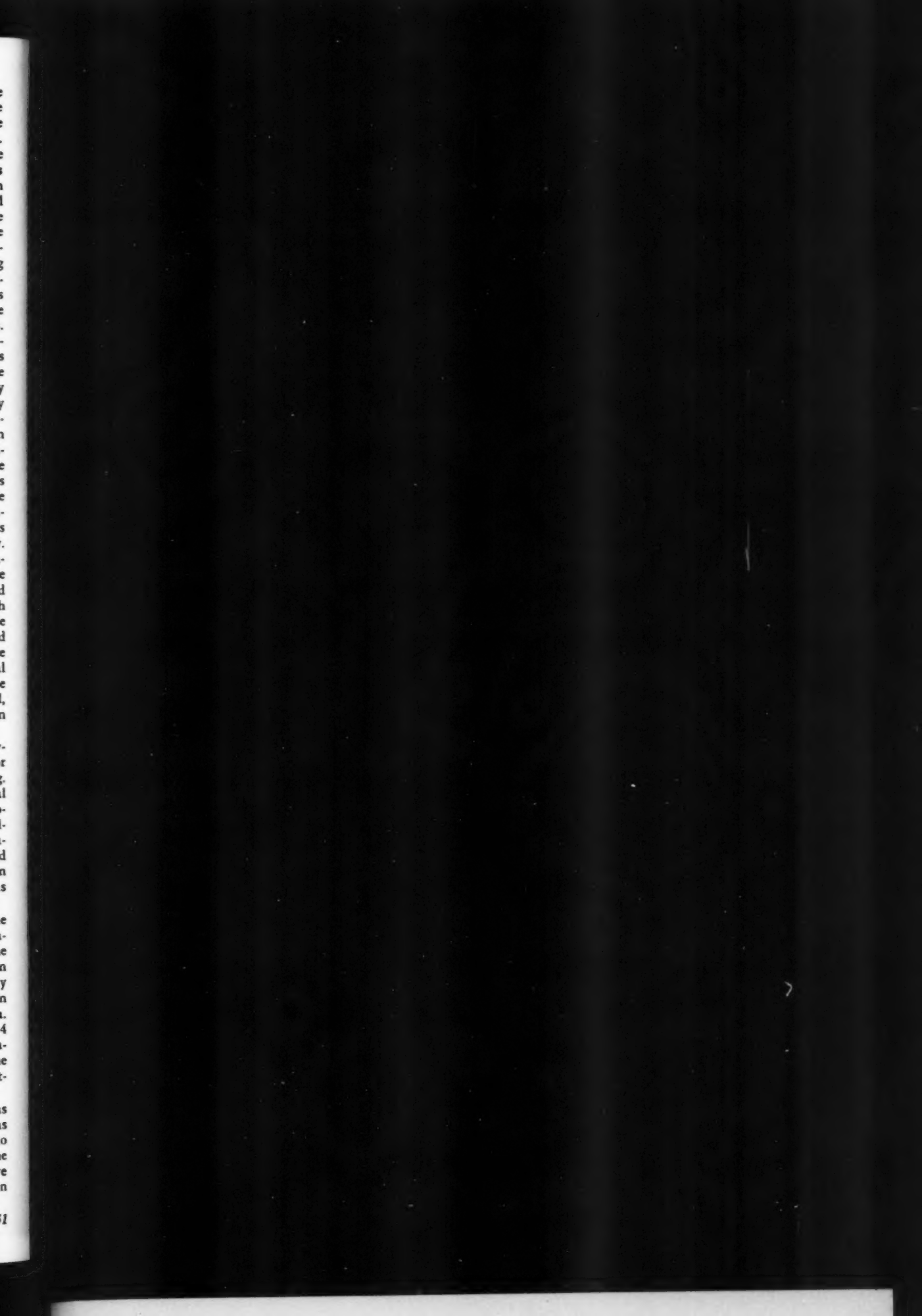
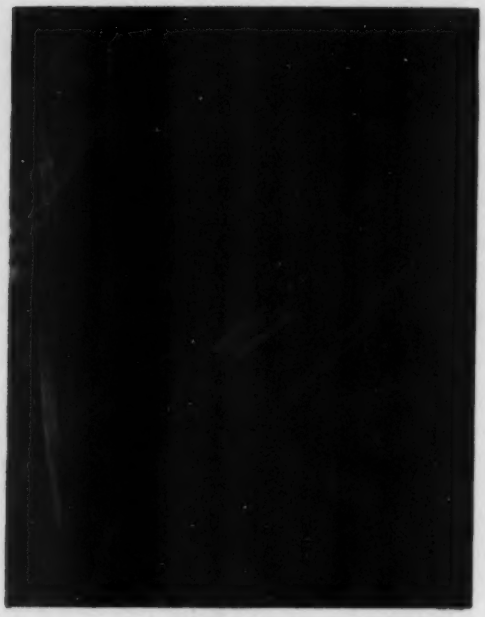


Plate 2 (Cont'd.)—Optical effects produced on polarized light by the cellulose crystallites of cellulose fibers and ray cells arranged in series with a first-order red selenite plate



E—same specimen as plate I-*C*

F—same specimen as Plate I-*D*

G—same specimen as *F* rotated 90 deg.

H—two fibers crossed at 90 deg. using a first-order bluish-light-gray plate instead of the selenite red plate

the 6-retardations, red background, to produce the 8-retardations, blue color, of the fiber in the plate.

Next a subtractive 2-retardations ray cell has been mounted lengthwise on the blue fiber to reduce the 8-retardations, blue color, to the 6-retardations red color under the ray cell as in plate 2-E. At the overlapping of two ray cells the subtractive 4-retardations of the two ray cells reduces the 8-retardations of the blue fiber to the 4-retardation yellow color of the overlapping area.

These results further show that the crystallites are arranged crosswise in the ray cells and that the optical properties of the ray cell crystallites are similar to those of the fiber crystallites; that is, the high-refractive index plane is lengthwise and parallel to the lengthwise direction of the cellulose crystallites of both types of structural elements.

Thickness variation

Variation in retardation color effects resulting from differences in thickness of a fiber is strikingly shown in the black and white plate 1-C and the colored plate 2-E. In plate 1-C the portion of the fiber on which the ray cells are mounted is the 2-retardations, light gray; the pointed end of the fiber to the left and extending toward the mounted ray cells is the 3-retardations, white.

If the fiber is oriented with its crystallites parallel and in series with the high-index refractive plane of a 6-retardations selenite plate, the additive effect of the 2-retardations, light gray, will produce the 8-retardations, blue, and the 3-retardations, white, will produce the 9-retardations, green, as shown in plate 2-E. Both colors indicate that the cellulose crystallites are oriented lenghtwise in the fiber.

Still a further arrangement with fibers and ray cells was made to prove the crosswise orientation of the crystallites in the ray cells. It involved arranging a fiber alternately in its two maximum brightness positions and in series with ray cells. Plate 1-D shows a 2-retardations fiber in one of its maximum positions. Each of the two ray cells having 2-retardations, light gray, is mounted singly lengthwise on the fiber. The crystallites of the ray cells are crosswise to those of the fiber and thereby produce a blackout through their superimposed area.

If the microscope stage is rotated 90 deg. so that the specimen is in its other maximum brightness position, as shown in plate 1-E, the area under the ray cells is again black, which confirms the crosswise orientation of the crystallites in the ray cells.

Further, when the specimen described in the preceding paragraph is observed in its maximum brightness positions in series with a selenite plate a new color combination is introduced. If the 2-retardations fiber is arranged parallel with the high-refractive index plane of the 6-retardations selenite plate the 8-retardations, blue fiber, is produced. Under this condition each of the 2-retardations ray cells arranged singly and parallel on the fiber reduces the blue color to the 6-retardations, red, throughout its respective area as in plate 2-F.

If, on the other hand, the 2-retardations fiber is arranged at 90 deg. to the high refractive index plane of the 6-retardations selenite plate, the fiber appears yellow because of the remaining unneutralized 4-retardations of the selenite plate. Moreover, a lengthwise mounted ray cell in this instance adds 2 retardations to the 4 retardations yellow and thereby produced the 6-retardations, red, throughout its respective area as in plate 2-G. This, too, confirms the crosswise arrangement of the crystallites in the ray cells.

Confirmative data on the reliability of the optical method that has been developed for this research were obtained by the use of a first-order 2-retardation plate in series with fibers and ray cells. This plate produces a bluish-light-gray background. Thus, a fiber that appears light gray in polarized light between crossed Nicols when arranged with its high refractive index plane parallel to the corresponding plane of the 2-retardation plate, so as to be in the additive position manifests the 4-retardation yellow color as shown in plate 2-H.

In contrast, a fiber of the same thickness as the preceding one, if arranged in the subtractive position to the 2-retardation plate, manifests black color as shown in plate 2-H. The long axis of the fiber that appears yellow in this plate is arranged with its long axis parallel to the high-refractive-index plane of the 2-retardation plate, where as that of the fiber that appears black is arranged with its long axis crosswise to the high-refractive-index plane of the 2-retardation plate. If ray cells that appear light gray in polarized light are examined under the preceding conditions prescribed for cellulose fibers, they manifest the yellow and black colors in the reverse order of those produced by the fibers.

The lengthwise arrangement of the crystallites in the fibers and the crosswise arrangement of the crystallites in the ray cells indicate that the major shrinkage of the fibers is crosswise and that of the ray cells is lengthwise.

Microscopical measurements of single isolated ray cells in the water-soaked and oven-dry conditions showed that they shorten lengthwise from 3.0 to 4.0 per cent during drying. These values approximate those of the radial shrinkage of the wood specimens from which the ray cells were isolated. They also confirm the conclusions drawn from data on the shrinkage that would be expected from the crystallite orientation in the ray cells.

Since the ray cells shrink lengthwise, which is the radial direction in the tree, the contention that the ray cells greatly restrain the wood from shrinking radially would seem in error. Accordingly, factors other than a restraining action of ray cells must be sought for explaining the fact that the shrinkage of wood is less in radial than in the tangential direction.

Conclusions

This paper presents microscopical data on the arrangement of the high and the low indices of refraction planes, which are properties of the cellulose crystallites, in wood fibers and ray cells and also X-ray data on the arrangement of the cellulose crystallites in the wood fibers and ray cells. Correlation between the microscopical and the X-ray data indicates that the high refractive index plane is oriented parallel to the lengthwise direction in the cellulose crystallites of both the fibers and the ray cells. Knowing the correlated relationship between the two types of data, it is possible to determine the arrangement of the cellulose crystallites in the wood fibers and ray cells by microscopical means and thus avoid the tedious preparation of X-ray specimens.

Photomicrographs in black and white and in color taken in polarized light indicate that the cellulose crystallites in the fibers are arranged, in general with their long axis parallel to the long axis of the fiber and crosswise to the long axis of the ray cells.

Major shrinkage of cellulose material or wood during drying occurs at right angles to the long axis of the cellulose crystallites in parallel arrangement. Thus, according to their crystallite arrangement, fibers should shrink most in their crosswise direction and ray cells in their lengthwise direction. These theoretical predictions on shrinkage are confirmed by actual microscopical measurements.

Radial shrinkage of wood ranges from 50 to 60 per cent of the tangential shrinkage; the discrepancy betwen the two types of shrinkage, in the past, has been explained on the basis that ray cells do not shrink lengthwise, which is the radial direction of the tree, and thereby greatly restrain radial shrinkage. In the light of the crosswise crystallite arrangement in the ray cells, the preceding explanation for less radial than tangential shrinkages of wood is apparently in error.

References

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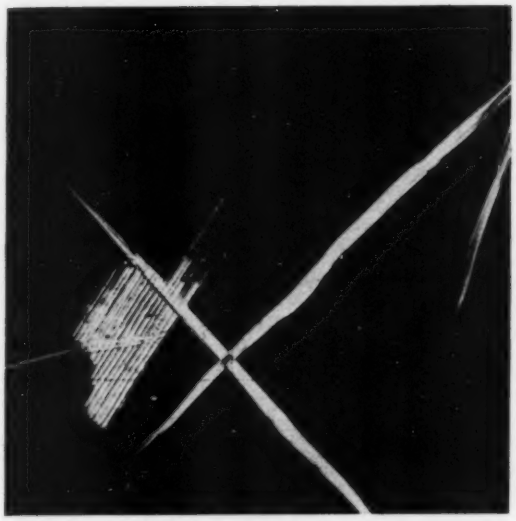
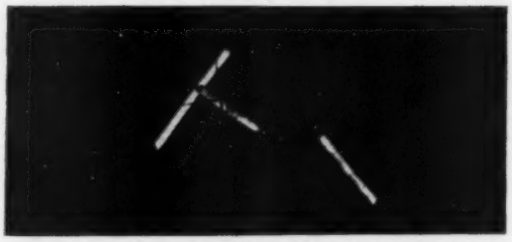
(2) Clark, G. L., *Ind. Eng. Chem.* 22:474 (1930).

(3) Gross, S. T., Patzer, W. A., and Ritter, Geo. J. *Paper Trade J.* 109(28):37 (1939).

Plate 1—Optical effects produced on polarized light by the cellulose crystallites of cellulose fibers and ray cells



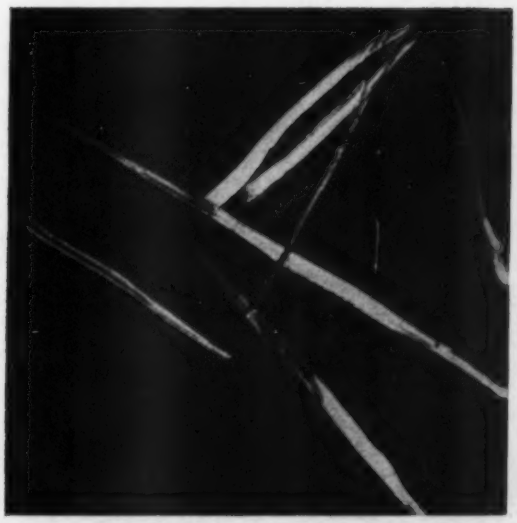
A—cellulose fibers crossed at 90 deg.



B—cellulose ray cells arranged at 90 deg. and partially overlapped

C—cellulose fiber upon which cellulose ray cells are mounted

D—cellulose ray cells mounted on a cellulose fiber

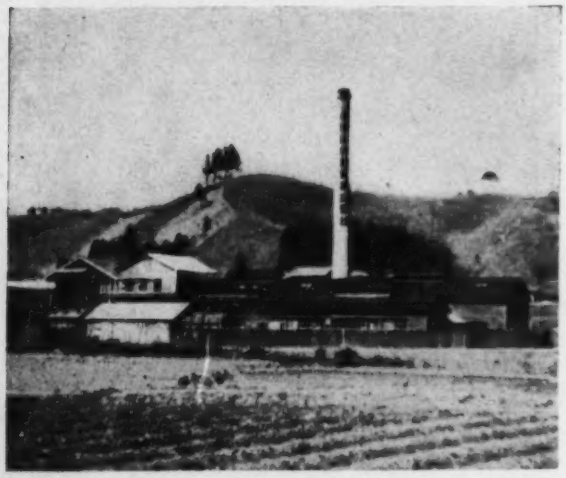


E—same specimen as *D* rotated 90 deg.

Japanese handmade paper industry

HAROLD R. ALLEY, *in* THE PAPER INDUSTRY *for September, reported on the Japanese pulp and paper industry, giving his observations and impressions. Mr. Alley visited the Ogawa section, where is centered the handmade paper industry, while serving as pulp and paper specialist for the Industry Division, GHQ, Far East Command. He is now staff representative of the Pulp and Paper Section, Industrial Department, National Safety Council, 425 N. Michigan Ave., Chicago.*

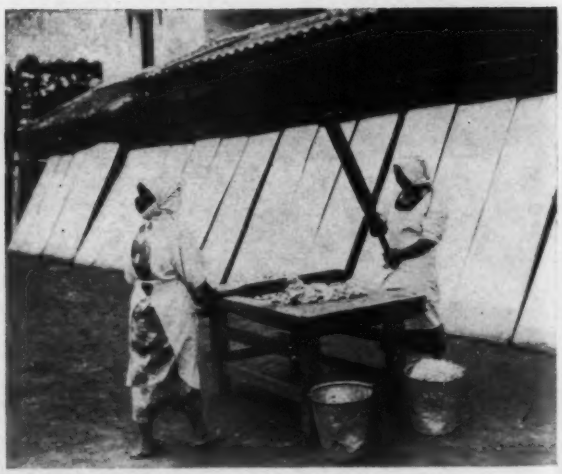
About 500 handmade paper establishments are located in the vicinity of Ogawa in the mountains about 60 miles northwest of Tokyo. Paper making in this area has flourished for several centuries. The Japanese produce a wide variety of handmade papers. These are unusual, beautiful, and useful for many purposes, such as wall paper, writing paper, greeting cards, etc. Modern handmade papers result from the highly skilled craftsmanship of the workers, developed through generation after generation. Although various vegetable fibres are used, most handmade papers utilize the bark fibre from such shrubs as kozu (paper mulberry), mitsumata, and gampi. These are cut in winter and bundled. After boiling or steaming, the bark is stripped by hand, washed and dried for delivery to the paper mills. Rice straw pulp is added to some papers, and wood pulp is occasionally used.



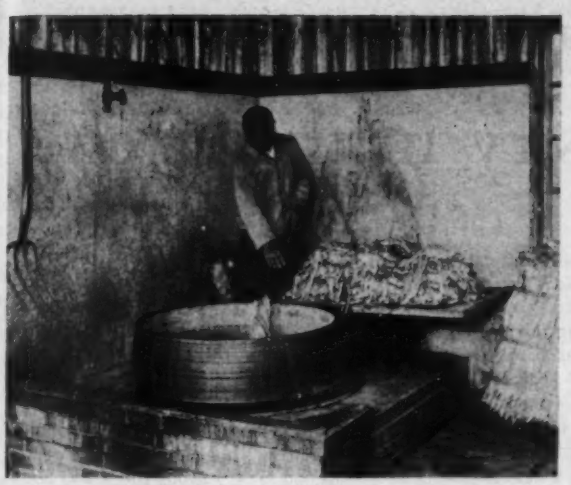
Sankosaisha Co., Ogawamachi Factory, one of the larger Japanese hand made paper producers

Handstripping bark to be used in paper

Washing and cleaning bark

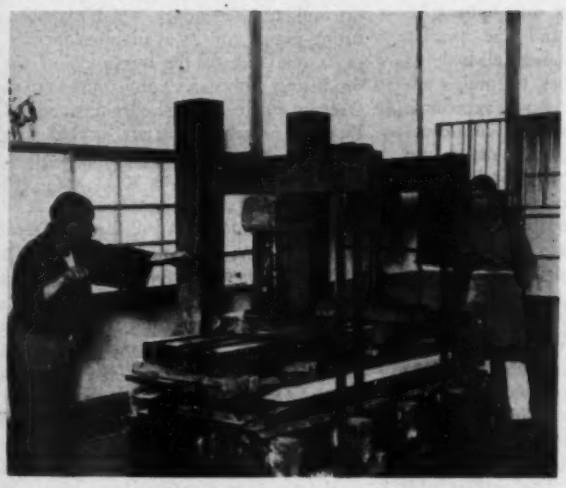


Preparing the fiber by beating

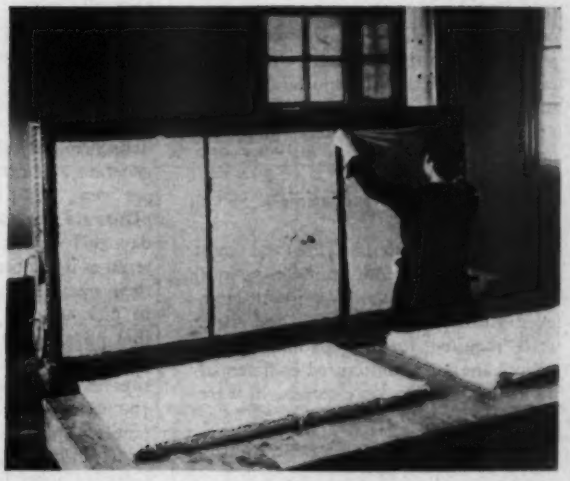


Cooking the fibrous material in open boilers

Papermaker (right) forms sheet on a hand mold; fresh formed sheet is removed or "couched" from the screen or wire



Hand press removes water from paper



Paper is dried on a steam heated iron surface

Air drying in the sun on smooth boards

Finishing room where the paper is cut and packaged

Desirable plant sites favor establishing a . . .

Cellophane Industry in the West

Part II in a series of three articles outlining how a cellophane industry can be developed in the West. Available raw materials were discussed last month. The abundance of markets is to be described in December.

WILLIAM C. McINDOE
Consulting Industrial Chemist

FACTORS governing the location of a rayon or cellophane plant are: availability of raw materials and chemicals, plots of level ground, labor supply, power, fuels, water supply, waste disposal and controls thereof, atmospheric humidity, climate, transportation facilities, freight rates, financial aspects (taxes and corporation fees), markets, etc.

Availability of raw materials and chemicals

Since raw materials are the most cheaply transported commodities, local sources may not be too important. However, all of the raw materials and chemicals required for the manufacture of cellophane are manufctured commercially in the West and are carried in warehouse stocks.

Plant sites

Sites or plots of fairly level ground ranging from about 100 to 500 acres will be sought (13). This amount of ground should give room for expansion of the unit types of buildings generally used: a 3-story chemical building for preparing the viscose solution and 1-story, saw-toothed roofed buildings for housing the casting machines. On the basis of similarity to rayon manufacture the floor space required to manufacture 35 million pounds of cellophane annually has been estimated by extrapolation of plots of data from two sources: Avram's "The Rayon Industry" and Mauersberger and Schwarz's "Rayon and Staple Fiber Handbook," 3rd Edition, 1939. Avram's data (14) yields 67,000 square feet per million pounds, or 2,345,000 sq. ft. From Mauersberger (15) we obtain a figure of about 44,000 sq. ft. per million pounds, or 1,540,000 sq. ft.

Labor supply

The rayon industry has held the thought that location near smaller towns reduced local competition for labor and consequently production stoppages due to labor unrest. Whereas rayon plants have many jobs calling for manual dexterity and attention to detail, therefore, hiring women up to 48.5 per cent of their work force, a cellophane plant does not; consequently all the help would be male. The labor supply in the West is predominantly American, white and with high school educations, owing to compulsory public education to age 16.

Power

At a reported 2.723 kwh. per pound, primarily motive power and lighting, a viscose rayon plant and the similar cellophane plant are not classed as electrochemical industries. In total, a 35-million pound plant would consume 10,880 kwyr. of which, other considerations being equal, they normally would generate about 85 per cent and buy 15 per cent, or 1,632 kwyr. Since both plants are run continuously 24 hours per day, 365 days per year, their main interest is in continuous or firm power and their own generation is speed-governed to pick up the motive load whenever that power supply falters as much as 5 per cent. There are many desirable plant sites in the Pacific Northwest within a 100-mile zone of influence of the Federal power distribution system now energized by electricity from the Bonneville and Grand Coulee Dams. The private utilities in the area have interconnected to form a distribution grid. Both the Federal Government and private utilities have steam generating plants under construction or planned to alleviate the present regional shortage of firm power until new hydroelectric projects can be brought in possibly by 1953-1954.

The estimated cost of energy to a chemical firm using 1700 kwyr., or about 1,050,000 kwhr. per month (85 per cent annual load factor) is given in Table 3. These bills are calculated on the cheapest and latest applicable published rates. In most cases service is supplied at 11,000 volts or higher. More favorable terms possibly could be obtained at some locations by direct negotiation, depending on maintenance of 85 per cent load factor and a larger annual demand. The cost of power anywhere on the Federal transmission lines is included. However, the Bonneville Power Administration would want the minimum annual demand to be about 6000 kwyr.

Fuels

Under the normal premise that a cellophane plant would generate 85 per cent of its own power, use high-pressure turbo-generators and employ the exhaust steam in the process, the choice of fuel for steam generation becomes very important. Three such Northwest fuels will be discussed: hogged wood, coal, and oil.

Wood in its various forms has been a major industrial fuel of the Pacific Northwest for many years. In this area, containing 40 per cent of the remaining saw-timber stand of the United States, it is produced as a byproduct of the sawmill and secondary wood manufacturing plants and its availability increases as one follows the migration of the producing industries into southwestern Oregon where the last virgin stands of Douglas fir saw timber are located. It is the cheapest fuel for steam generation, costing from $0.145 to $0.29 per 1,000 lbs. of steam from and at 212 F. or $1.50 to $3.50 per unit (200 cu. ft.) delivered.

An industrial plant locating near a well-established sawmill or secondary manufacturer could expect to have adequate supplies of sawmill wastes for its hogged fuel at a minimum price. Also an adjacent pulp mill might have surplus steam to dispose of. During World War II a transportation survey by the Oregon Forest Products Laboratory set the economic limit transportation of hogged fuel for rail at 60 miles; by truck, at 30 miles, with 50 miles by truck possible from some mills who subsidized the trucking operation to barge points on the Columbia River. For steam generating purposes one unit of hogged fuel is equivalent to 2½ barrels of oil.

Oil has not been discovered in commercial quantities in the Pacific Northwest.

The industrial fuel oil used in this area is a 10.0 deg. A.P.I. residuum containing about 18,500 Btu. per pound or about 6,386,000 Btu. per bbl., brought to the region by tankers entering the Columbia River and Puget Sound from California origins. On the basis of $2.20 per bbl. at oil terminals plus a $0.10 handling charge, 1000 lbs. of steam would cost $0.43. Quite often plants using hogged fuel in the Pacific Northwest have oil-burning standby equipment for emergency use; therefore, the calculated cost of producing 1000 lb. of steam by this combination (500 lb. with hogged fuel plus 500 lb. with oil) would

be from $0.28¾ to $0.36, depending on the cost of hogged fuel.

Steam coals are available in and to the Pacific Northwest ranging from lignite to bituminous, from 8320 Btu. per lb. and 16.0 per cent ash to 12,890 Btu. per lb. and 6.4 per cent ash, all within a 1000-mile radius of Portland, Oregon. Delivered prices (Portland) range from $6.44 per ton to about $10.30, with the transportation cost amounting to about 50 per cent of the delivered price. Because of their excellent storage properties, low ash content and high Btu. content, the main industrial coals in the Pacific Northwest are shipped in by rail from Utah and Wyoming. Therefore, the cost of generating 1000 lb. of steam with coal would be from about $0.45 to $0.52. The use of coal brings with it problems of ash disposal, smoke abatement and fly-ash elimination.

Table 4 gives the average comparative costs in 1949 of steam generation by fuels commercially available in the Pacific Northwest. Plants locating in northern California undoubtedly would use oil. In Henderson, Nevada, one of the sites chosen for study, the fuel is oil, but Stauffer Chemical Company has surplus steam available at cost at about 100,000 lb. per hour continuously at 150 psig. pressure.

Water supply

A rayon or cellophane plant has exacting standards for its industrial water supply. An ample supply is sought ranging between 9-20 million gal. per day, of as near zero hardness as possible, free from iron or manganese, from organic matter subject to putrescence, free from color or turbidity, and from any excessive bacterial content, both pathogenic and saprophytic.

The abundant rainfall of the Pacific Northwest guarantees abundant water supplies. Henderson, Nevada, gets its water in a 40-inch pipe line from Lake Mead back of Hoover Dam. Any northern California site might get water from Lake Shasta back of Shasta Dam or from the Sacramento River. Idaho has sites available on the Snake, Priest and Spokane Rivers and possibly Lakes Pend Oreille and Coeur d'Alene.

Generally speaking the waters of the Pacific Northwest are low in total solids, low in hardness, high in dissolved silica (SiO_2), low in both calcium and magnesium, high in the alkalis of sodium and potassium (present chiefly as bicarbonates), low in iron, low in sulphates and completely saturated with oxygen. Table 5 gives the analyses of some typical waters of the Pacific Northwest (16) (17) (18).

Waste disposal

Controls of air and stream pollution must be carefully studied and provided

Table 3—Industrial Power Cost

Plant Location	Utility	Schedule No.	Rate	Monthly Cost
Bellingham, Wash.	Puget Sound Power & Light Co.	34, T-1	Pulp & Paper Mills*	$4,685.00
Tacoma, Wash.	Tac. Dept. of P.U.	E-1	General Power Service	4,073.00
Vancouver, Wash.	Clark Co. PUD	83	High Tension Industrial Service	4,678.75
Longview Kelso, Wash.	Cowlitz Co. PUD	P-2	" "	5,273.75
Portland, Ore.	Pacific Power & Light Co.	32	High Voltage Industrial Power Service	4,936.75
	Portland G. E. Co.	83	Large Industrial	4,932.75
Spokane, Wash.	W. W. Power Co.	21	Large Light & Power	5,442.50
Eugene, Ore.	Eugene Water & Elect. Bd.	D	General Power Service	7,195.20
Klamath Falls, Ore.	California-Oregon	S-1	" "	6,483.00
Henderson, Nev.	Colorado River Comm. of Nevada	P	" " **	3,705.88
Pacific Northwest	Bonneville Power Adm., U.S.D.I.	Basic Industrial	" " *** ($17.50/KWyr.)	2,479.17

Notes: The arbitrary assumption that the proposed plant would generate 85 per cent and purchase 15 per cent was made for calculation purposes only. The cost of high-pressure turbo-generators and high cost of boiler fuels has influenced some pulp and paper mills and shipyards in the region to purchase all their power requirements. *—Assumption that this rate would be available to large chemical firm. **—Three mills per kw. hr. based on annual load factor of 100 per cent. ***—Anywhere on the federal transmission lines.

Table 4—1949 Cost of Fuel for 100 Pounds of Steam

Items	Hogged Fuel @ $1.50	Hogged Fuel @ $3.50	Combination Oil & Hog. Fuel**	Oil	Coal
Column	(1)	(2)	(3)	(4)	(5)
Heat Value	4500 Btu/lb.	4500 Btu/lb.		152,050 Btu/gal.	12,890 Btu/lb.
Measure	4370 lb./unit	4370 lb./unit		42 gal./Bbl.	2000 lb./ton
Cost	$1.50/unit	$3.50/unit		$2.20/Bbl.*	$10.30/ton
Assumed Handling Cost	$0.50/unit	$0.50/unit		$0.10/Bbl.	$0.60/ton
Total Fuel Cost	$2.00/unit	$4.00/unit		$2.30/Bbl.	$10.90/ton
Cost per Million Btu	$0.10	$0.20		$0.36	$0.42
Boiler Efficiency	67%	67%	71%	81%	78%
Cost/1000# Steam***	$0.145	$0.29	$0.28 3/4 - $0.36	$0.43	$0.52

Notes: *—$2.10 per bbl. at oil terminal plus 10c per bbl. delivery. **—Calculated for 500 lbs. steam with oil plus 500 lbs. steam with hogged fuel. ***—Saturated steam from and at 212 F.
Source: Columns 1, 2, 4, 5—Christerson, P. D., "Steam and Power" p. 3; Column 3 calculated.

Table 5—Typical Analyses of Waters of the West (In parts per million)

Source of Sample	Total Dissolved Solids	SiO_2	Fe	Al	Ca	Mg	Na & K	Mn	Cl	SO_4	HCO_3	Total Hardness as $CaCO_3$
1. Aberdeen, Wash., municipal supply from Wynoochee River	63	6.0	2.0		11.0	3.6	4.7		10.0	2.4	48	42
2. Bellingham, Wash., municipal supply from Lake Padden	32	2.9	0.2		4.5	1.4	4.0		3.0	3.9	19	17
3. Everett, Wash., municipal supply from Sultan River	23	5.8	0.1		4.1	0.7	2.0		0.9	3.2	15	13
4. Hoquiam, Wash., municipal supply from Little Hoquiam River	52	18.	0.2		5.1	25.	5.0		5.2	1.6	30	23
5. Seattle, Wash., municipal supply from Cedar River and Lake	46	6.4	0.9		5.8	1.5	2.2		1.5	2.0	26	21
6. Tacoma, Wash., municipal supply from Green River	39	14.	0.1		5.0	1.2	3.3		1.6	3.2	21	17
7. Astoria, Ore., municipal supply from Bear Creek	70	26.0	0.2		5.4	2.7	7.2		6.8	4.1	30	25
8. Salem, Ore., municipal supply from infiltration galleries along Willamette River	52	16.0	0.1		5.0	2.3	5.8		4.0	2.7	32	22
9. Portland, Ore., municipal supply from Bull Run River and Lake	25	3.9	0.1		2.0	0.7	3.8		2.4	—	13	8
10. Longview, Wash., from wells about 250 ft. deep	256	56.	0.0		52.0	10.0	8.2		13.0	3.6	208	171
11. Willamette River between Springfield and Eugene, Ore.	71	22.7	0.2	1.3	4.9	0.8	6.7	0.0	2.8	Trace	31.7	15.5
12. McKenzie River at Hayden Bridge	73	22.6	0.2	1.3	4.3	1.1	6.4	0.0	2.8	Trace	30.5	15.5
13. Henderson, Nev., municipal supply from Lake Mead	547								103.	324.		166.

for by any new plants in the West. The Western States are determined to avoid any fatal disaster caused by air pollution, such as that at Donova, Pennsylvania, in October-November, 1948, and to eliminate insofar as possible smogs like that of Los Angeles. Government agencies have been set up to detect and study methods of control or elimination of air pollution as well as stream pollution. Legislation is beginning to reach the statute books. Detailed plans for sewage and waste disposal must be submitted to and approved by the proper agencies of the Western States before plant construction can begin.

Climate

Climate and atmospheric humidity are of importance only as to the load placed on the air-conditioning system and on interruptions to transportation of materials to and from the plant. However, ventilation and air-conditioning play very important roles in a cellophane plant. In the viscose process used, noxious, toxic and/or inflammable gases must be removed or reduced to concentrations below dangerous limits; such as, carbon bisulphide, hydrogen sulphide and sulphur dioxide. Recovery equipment is incorporated into the ventilation and air-conditioning system.

Transportation

Transportation facilities needed at the plant site are rail or water connections. If the plant is located outside the corporate limits of a town then an adjacent highway or bus service for the employees is desirable.

Financial aspects

Taxes and corporation fees have direct bearing on overhead and fixed charges. The States of Washington and California have sales taxes and no income tax. Corporate fees and property taxes have been moderate. Oregon has an income tax similar to the Federal individual income tax. However strong interests are advocating its replacement by a sales tax. Here also corporate fees and property taxes have been reasonable. Nevada has neither income tax nor sales tax. The only taxes are relatively low county taxes billed on the basis of assessed valuation of personal property, which includes inventories, and of machinery and equipment. Corporate fees have been low.

Logical western plant sites

Of the many sites available in the West, those chosen arbitrarily for purposes of illustration and calculation of freight rates fall naturally into four regional classifications or areas: Puget Sound, Lower Columbia River Basin, Willamette Valley, and interior sites.

Puget Sound Area: Bellingham, Wash., on the Bellingham Bay of the Georgia Strait entrance to Puget Sound, is a pulp and sawmill town about 40 miles north of Seattle. Water supplies are adequate, with deep water transportation to compete with rail connections. It is served by the Chicago, Milwaukee, St. Paul & Pacific, Northern Pacific, and Great Northern, with connections with the Canadian Pacific in British Columbia.

Tacoma, Wash., is located on Puget Sound about 25 miles south of Seattle. Pulp and paper mills are located here. Water supplies are adequate. Deep water and rail transportation are available. It is the western terminus of the Chicago, Milwaukee, St. Paul & Pacific Railroad and is also served by the Northern Pacific, Great Northern, and Union Pacific.

Lower Columbia River Basin: Longview and *Kelso, Wash.,* are on the Cowlitz River, close to the Columbia River, and have deep water navigation. Longview is a pulp and sawmill town. Both are served by the Northern Pacific, Union Pacific, Great Northern and Chicago, Milwaukee, St. Paul & Pacific railroads. Water supplies can be developed.

Vancouver, Wash., and *Portland, Ore.,* are on deep water channels of the Columbia River and Willamette River about 110 miles upstream from the Pacific Ocean. Portland's potential industrial areas along the Columbia River still await development. Water supplies are adequate. Both are served by the Northern Pacific, Union Pacific, Great Northern, Chicago, Milwaukee, St. Paul & Pacific, and Spokane, Portland & Seattle railroads. Portland in addition has the Northwest terminus of the Southern Pacific.

Many additional excellent plant sites exist on both sides of the Columbia River east of Portland and Vancouver. The north bank is served jointly by the Spokane, Portland & Seattle and Union Pacific railroads while the main line of the Union Pacific follows the south or Oregon side. The ship lock in Bonneville Dam makes deep water navigation available clear to Pasco, Washington, about 200 miles inland from the ocean.

Willamette Valley is a combination of rich farming areas with sawmills and pulp mills mixed in. A migration of lumber, sawmill and pulp interests is underway into southwestern Oregon. Oregon City, Newberg, Lebanon, and Springfield are all pulp mill towns and the last three have splendid plant sites available. Water supplies are ample and fine. Springfield on the Mackenzie River is the location of the new kraft pulp and board mill of Weyerhaeuser Timber Co. The Southern Pacific provides rail connections, and water transportation is available.

Interior sites of eastern Washington and Oregon and Idaho would involve a rail haul for the normal dissolving pulp from Western Hemlock, but might develop alternate supplies from Engelman Spruce, lodge pole and Ponderosa pines of the region.

Spokane, Wash., is on the Spokane River about 70 air miles from Grand Coulee Dam. It is served by the four transcontinental railroads: Northern Pacific, Great Northern, Union Pacific, and Chicago, Milwaukee, St. Paul & Pacific, and by the Spokane, Portland and Seattle Railroad. Water supplies are adequate.

Klamath Falls, Ore., is located on the southern end of Klamath Lake, in Central Oregon, about 230 air miles south of Bonneville Dam and is a lumber and sawmill town. It is served by the Union Pacific and Great Northern Railroads. Water supplies are adequate. It is the location of the Hercules Powder Co.'s new research laboratory on forest products.

Henderson, Nev., within 15 miles of Hoover Dam, is favorably located for very cheap hydroelectric power and for ample industrial water from the 40" pipe line coming from Lake Mead behind the dam. Some of the buildings and land of the 4080-acre wartime Basic Magnesium project are still available for lease or purchase from the Colorado River Commission of Nevada. A sewage disposal plant takes care of sanitary waste. There are few restrictions on disposal of industrial wastes. The Union Pacific Railroad serves Henderson.

Northern California plant sites can be found on the upper reaches of the Sacramento River, on the mainline of the Southern Pacific Railroad and well within the 100-miles radius of influence of Shasta Dam powerhouse (perhaps Redding and Red Bluff), Lake Shasta and the Sacramento River are possible sources of water.

Acknowledgment

The author wishes to acknowledge the help and cooperation of a number of individuals and companies, too numerous to mention, who supplied information for this series of articles.

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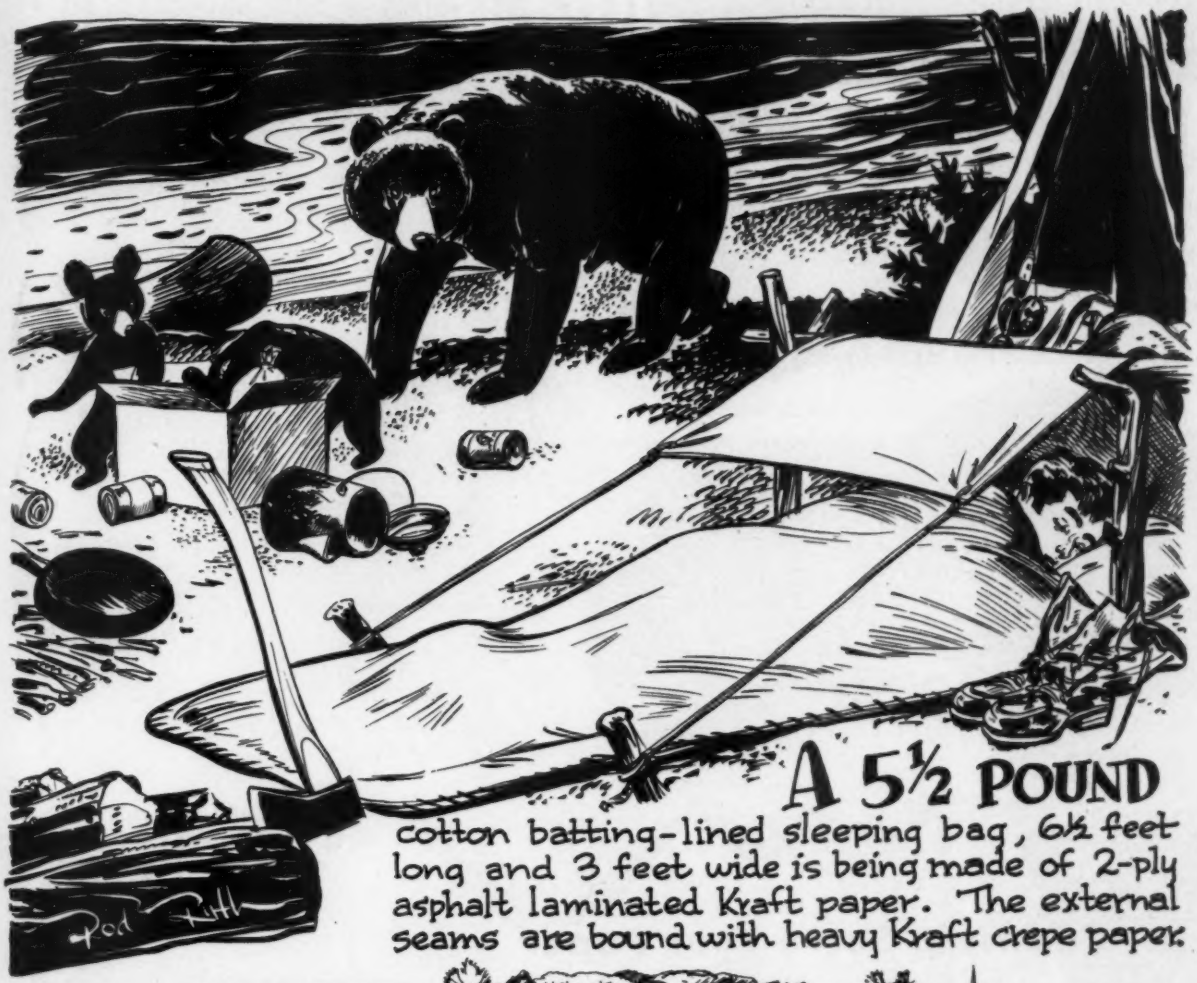

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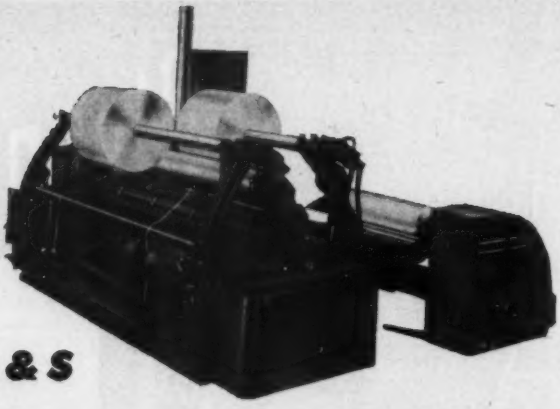

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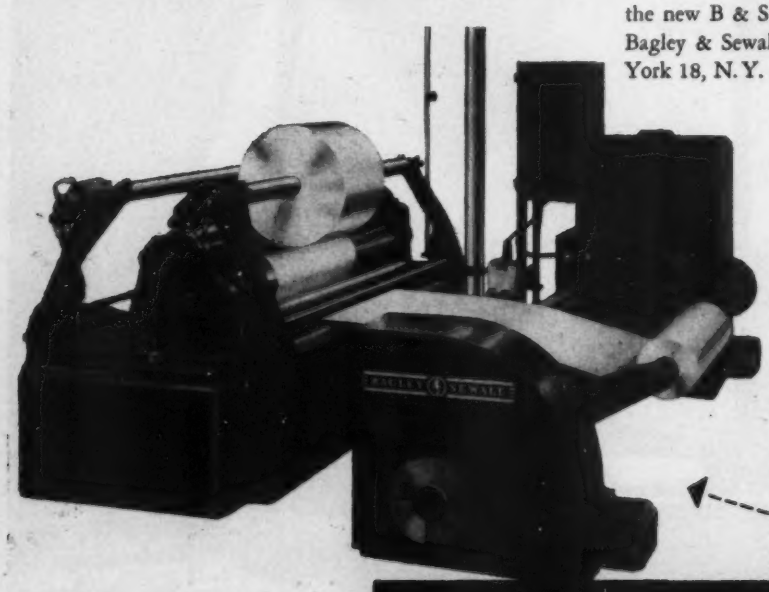

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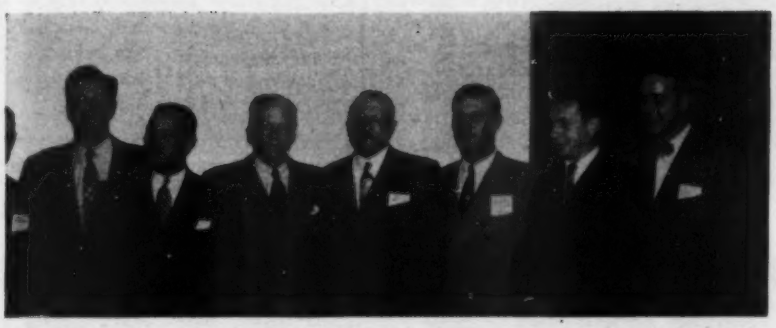

PARTICIPANTS IN CHICAGO TAPPI'S OCTOBER program are seen at the speaker's table during the meeting: (L. to R.) J. R. Fulghum, Socony-Vacuum Oil Co.; A. L. Magnuson, Kelco Co.; Chet Spaulding, Tested Papers of America; C. K. Royce, Office of Navy Material, the speaker; V. V. Vallandigham, Kelco Co., section chairman; Charles Krebs, Atlas-Boxmakers, and M. W. Shaver, Williamson Adhesives.

Paper Industry Praised for War Packaging Role

Although the paper industry contributed greatly to solving the packaging problems of World War II, there is still much work to be done in the field. This was the belief expressed by C. K. Royce, head of the Packaging Section, Office of Navy Material, Washington, D. C., as he discussed military packaging at the October dinner meeting of Chicago TAPPI.

Mr. Royce stated that present package planning calls for performance of flexible barriers in a temperature range of from –65F to 165F. He noted that the Korean War has presented new and difficult packaging problems, which the Armed Forces are attempting to solve through the cooperation of industry. The present classifications of flexible barriers as recognized by the Navy are as follows: waterproof, greaseproof, waterproof-greaseproof, and water-vapor proof. The speaker also covered in detail the recent changes in specifications and procurement procedures.

Concluding with the importance of correct packaging of materials, Mr. Royce declared that an inadequate supply of packaging materials would have delayed invasion of Asia and the Japanese mainland during World War II. Last year's cushion of 7 per cent of kraft paper (production against capacity) and consumption of within 4 per cent of capacity in the containerboard field presents a serious problem. Mr. Royce called for industry to find some source of fibre other than wood.

The address was preceded by a motion picture, "Pack it Right," which showed badly damaged packages piled high in advance supply depots during World War II. Damage was caused principally by handling, corrosion, mold, and rusting of metal containers. Industry and military experts combined to improve packaging methods, and by the end of the war a much higher percentage of packaged units were arriving at their destinations in usable condition.

At the conclusion of Mr. Royce's remarks, the more than 200 members and guests attending the meeting were divided into groups to hear panel discussions on individual packaging problems. Specialists in various fields led the discussions. Section I dealt with greaseproof and greaseproof-moistureproof-vaporproof barriers, with the following panel members: J. G. Surcheck, Dearborn Chemical Co.; Walter Newton, Arvey Corp.; Heinz Loeffler, Exeter Paper Co.; L. M. Burgess, H. P. Smith Paper Co.; P. O. Pedersen, Cadillac Products Inc., and William Troph, Dobeckman Co. Section II, weatherproof barriers, featured Ralph Knapp, Thilmany Pulp & Paper Co.; Irv Stoeller, Fibleco Illinois Co., and David Bookshester, Paisley Products Co. Section III concerned volatile corrosion inhibitor treated packaging materials, with John LeBolt, Cromwell Paper Co., and Carl Salzman, Nox-Rust Chemical Corp., as panelists. Section IV, tape and sealed rigid metal containers, featured Bill Knox, Knox & Schneider; Roy Sullivan, Inlander-Steindler; Ed Katz, Greenwood Packaging; William Givens, Mystik Adhesives Products, and Ed Greenman, Mid-States Gummed Paper Co.

V. V. Vallandigham, chairman of the section, opened the meeting. The program was in charge of Chet Spaulding.

Paper Machine Variables Discussed at Ohio TAPPI

More attention to experimentation on the paper machine was urged by Dr. Borje Steenberg of the Swedish Royal Institute of Technology as he addressed the October 8 meeting of Ohio TAPPI

OHIO TAPPI NOTABLES at the recent meeting included (L. to R.) Ken Gechegan, national TAPPI president; Dr. Steenberg, and Herb Smith, chairman of the section.

at the Manchester Hotel in Middletown, Ohio. The speaker emphasized that the machine lost production due to an experimental program was usually only a small fraction of the total project essential cost.

Speaking on the topic, "The Effect of Some Paper Machine Variables on the Properties of Paper," Dr. Steenberg described the use of stress-strain measurement to study paper machine operation. Experimentation in the wetting and subsequent drying of sheets under tension has shown that the directional strengths of the sheet can be reversed without disturbing the fiber orientation. Pendulum type equipment in common use in the United States for tensile measurements is not capable of being adapted to this type of study. The equipment necessary is an electronic controlled instrument that permits constant rates of loading and elongation to be maintained.

From the studies made it was shown that paper exhibits rheological properties somewhat resembling other structural materials. The rheological approach pays particular attention to the pre-rupture stress-strain characteristics, instead of concentration merely on rupture strength, and it emphasizes the importance of the time factor, both in testing and usage of the materials. From analysis of the stretches, logical explanations of the edge effect of machine made paper can be made. The dimensional stability of paper can be analyzed and machine operating conditions outlined to produce the desired effects.

Ohio Section Chairman Herb Smith of Mead Corp., presided. The national TAPPI president and vice president, Ken Geohegan and George Pringle, both members of the section, attended the session.

Lake Erie TAPPI Announces 1951-1952 Program

Problems typical of those encountered by the converter were discussed October 19 at a dinner meeting of the Lake Erie TAPPI section, which was held in Cleveland. The speakers included P. H. McDowell, director of purchases for A. L. Garber Co., Ashland, Ohio, who talked on folding cartons, and R. O. Spalding, corrugated quality supervisor for Owens-Illinois Glass Co., Toledo, who discussed corrugated containers.

Programs for the remaining section meetings are as follows: November 16, Does a Training Program Pay?; December 21, Christmas Party; January 18, Tomorrow's Protective Packaging—a symposium; February 15, Cashing in on a Suggestion System; March 21, Graphic Arts; April 18, Practical Process Controls for Better Quality; May 16, Folding Cartons, and July 18, Summer Meeting.

Fifth Alkaline Pulping Conference at Richmond

Wood processing and high-yield pulping processes feature discussions at Richmond meeting. R. H. Stevens, Jacksonville, prepared this report for THE PAPER INDUSTRY

Improved efficiency by elimination or reduction of waste and conservation of raw material by increased yield was the keynote of the Fifth Annual Alkaline Pulping Conference held September 26 and 27 at the Hotel John Marshall in Richmond, Va. More than 200 delegates heard authoritative discussions on raw materials, chip preparation, and pulping methods.

Bob Fuller of Gulf States Paper Corp., Tuscaloosa, Ala., planned the series of papers presented. Chairman of the pulping committee was Harry Vranian, Chesapeake Corp., West Point, Va. Featured during the two-day session was a visit to the Chesapeake mill and a luncheon at the Williamsburg Inn sponsored by Sutherland Refiner Corp.

During the discussions considerable interest was shown in a suitable control test for high-yield pulping. The TAPPI Standard Permanganate Number has been judged inadequate for very raw pulps. The alkaline pulping committee considered the situation and advised that research on the problem is urgent. The group agreed that the Roe Chlorine Number is the most promising control test available, but that a quick method of applying it is needed.

Technical Papers Presented

The first paper of the opening session was presented by James W. Cruickshank, U.S. Forest Service, Asheville, N.C., on the subject, "The Cellulosic Raw Materials Situation." He stressed the rapid depletion of the more sought after pulpwoods in contrast with the under-utilization of hardwoods, which are growing at a rate faster than the annual cut. Whenever possible, methods should be devised for the utilization of the latter.

J. M. Ralston of Union Bag & Paper Corp., Savannah, Ga., read a paper on "Checking Wood Quality," during which slides were used to show old and rotten wood, "catface" wood, crooked sticks, and material too small to be chipped economically. His address was followed by Vance P. Edwards, a consultant of Cornith, N.Y., and a past president of TAPPI, who spoke on "Chipping Operations." Favored was the moderately large (¾" and larger) chip, while the "sawdust evil" was explained in detail. Slides bearing data and graphs covering eight-months periods prior to and after making changes in woodroom operation that reduced the fine content were used to prove the detrimental effect of this fraction on physical properties of the finished product.

The Sixth Annual Alkaline Pulping Conference will be held in September 1952. Exact time and place will be announced later. Main subject to be covered will be kraft recovery processes.

"The Effect of the Chipping Knife on Wood Conservation" was discussed by Harold F. Wood Jr. of Heppenstall Co., Pittsburgh. It was shown that dull knives break or shatter the fibrous structure. The magnetic clamp should always be used for holding the knives while grinding, since this speeds up the operation sufficiently to permit grinding enough knives during one shift to supply a 24-hour chipper operation. Found best was a rate of travel of 68 feet per minute and a grinding speed of 3,400 rpm, with the best level being from 38 to 40°.

J. J. Armstrong, Union Bag & Paper Corp., Savannah, Ga., discussed "Usable Waste in the Woods," calling attention to the need for utilizing to the utmost all logging wastes, tops, branches, etc. The final paper in the opening session was on the topic, "Wood Losses in Chipper Operation," and was presented by N. P. Wardwell, Carthage Machine Co., Carthage, N.Y. A film was shown on the actual passage of the chipper knives through the log. Although pictured was a 10-knife chipper turning at 600 rpm, the film showed clearly how the knife entered the log, shaving off a slice, which bent away from it and shattered into chips.

Opening the first afternoon session was a paper by Robert Ellwanger of Chesapeake Corp., West Point, Va., on "Suspension Burning of Bark Refuse." The swirling action of the "Hurricane Blast" air nozzles was explained through a colored film. The bark is pulverized and blown into the furnace in much the same manner as concentrated black liquor is blown into a recovery furnace. A production of 3.35 lbs. of steam per pound of bark, equivalent to from 1,750 to 2,000 lbs. per cord, was claimed for this method of burning bark refuse.

"A Survey of Chipping Operations," based on a TAPPI questionnaire, was presented by R. H. Stevens, National

Alkaline group visits Chesapeake Corp.

Henry Vranian, Chesapeake Corp. (center) takes group through mill

Sture Olsson, Chesapeake v. p. (second from right) points out features of pulp dryer

Mill visitors inspect wood yard operations

Erik Zimmerman, gen. supt., welcomes visitors

R. R. Fuller, Gulf States Paper Co.

R. G. Macdonald and R. O'Donoghue

Doug Sutherland (l.) views pressure washing system

R. F. Erickson and Geo. Scofield of Rayonier Inc.

Container Corp. Replies to the questionnaire did not appear to fall into any definable pattern, reflecting striking differences in operating methods. M. G. Selden of Albemarle Paper Mfg. Co., Richmond, told of the preparation of pentaerylthritol estes of the acids of tall oil.

The final paper on the first day's program was by Harry Vranian of Chesapeake Corp. and Robert D. Nickerson of Combustion Engineering-Superheater Inc., New York, N.Y., on "Flash Drying of Lime Kiln Feed." Described was a new method devised to augment the capacity of a short lime kiln that has no chain section. A 9 by 120 foot kiln installed when the production was 270 tons per day had to suffice for a daily production of 570 tons. Space limitations prevented adding another kiln or lengthening the existing one. The problem was solved by utilizing heat being lost in the stack gases. These were drawn from the plenum chamber of the lime kiln stack and used to remove water from particles of lime mud dispersed in them by means of a cage mill. The net result has been a 40 per cent increase in the lime burning capacity of the kiln, a 38 per cent reduction in fuel, and a saving in fresh lime amounting to 37 per cent.

On the second day, with Bob Fuller serving as chairman, the first paper was by K. G. Chesley, Crossett Lumber Co., Crossett, Ark., on the subject, "Cooking Knots and Rejects." In Mr. Chesley's absence, the paper was read by Paul L. Gilmont. Laboratory research with pilot cooks on knots and rejects yielded 93 per cent in pulp equivalent to that normally produced in the mill. The speaker evaluated the effect of returning these to the digester. An increase of several percentage points in digester yield, with consequent saving in raw material, resulted. The quality of the mill product was not adversely affected.

Fred Keyes, North Carolina Pulp Co., Plymouth, N.C., in the absence of Robert Bowen, read a paper prepared by the latter on "Controls, Circulation and Indirect Heaters." Mill experience has resulted in abandonment first of indirect heating and later of pump circulation, with improvement in pulp quality and yield.

This was followed by a paper from the Forest Products Laboratory in Madison, Wis., prepared by J. S. Martin and K. J. Brown, but presented by J. N. McGovern, on "The Effect of Bark in Sulfate Pulping of Shortleaf Pine." It was pointed out that the bark actually contains more cellulose than lignin, but also contains "stone cells." These are extremely short. Yields of the order of magnitude of 18 per cent with normal permanganate numbers were obtained in laboratory cooks on bark alone. As the yield of a normal kraft cook increases, the bleach consumption naturally rises. The presence of bark has the effect of further augmenting the bleach requirement. The addition of bark to bark-free chips in known amounts up to 15 per cent has no effect on tearing strength and little on bursting strength. Other tests, such as tensile, folding endurance, and so on, fall off in direct proportion to the amount of bark present. Beyond

15 per cent the bursting strength is affected adversely, but the tearing strength still remains the same.

Continuous Manufacture Discussed

J. McK. Limerick, Bathurst Power & Paper Co., Bathurst, N.B., introduced the subject of high yields in a paper entitled, "Continuous Manufacture of Semichemical Pulp for Corrugating Boards." Slides showed the compact and simple installation of continuous cooking equipment, with the chipper on the operating floor and adjacent to the feed screws. Employing a "modified kraft liquor," 150 psi, and 15 minutes cooking time, a yield of about 80 per cent is obtained from unbarked hardwoods, chiefly aspen, beech, and birch. This pulp is refined roughly by two 48-inch Sutherland refiners in parallel and washed on one two-stage Swenson-Neiman washer, which delivers a black liquor with 6 per cent solids. The present rate of production is 140 tons per day, because that is the top capacity of the paper machine. The two Chemipulper-Asplund Defibrator units (each of 6 x 24 inch pipes) have a capacity of 160 tons a day.

The entire operation is controlled by the single flute crush test devised at the Institute of Paper Chemistry, Appleton, Wis. When this shows a drop in rigidity of the finished board, operating procedures are changed in the direction required to increase the rigidity. How this control test may be used to follow the effect of operating variables was shown by the following table:

	Freeness	Single Flute Crush
Blowstock (after Defibrator)	800	2.7*
Semi-refined (after Sutherlands)	660	14.2*
Fully refined (after mill refiners)	490	27.5*
At paper machine head box	275	33.8*
After the calenders		33 to 35†

*Hand sheet
†Finished sheet

Prior to the installation of the hardwood semichemical process, the firm had employed a high-yield (62 to 64 per cent) kraft, using pine, with admixture of spruce groundwood (up to 40 per cent). This sheet had a single flute crush of only 23 to 24 psi.

Dr. Limerick declared that he has used the Roe Chlorine Number test for all types of pulps made at Bathurst from bleached sulphite, through high-yield kraft, hardwood semichemical to spruce groundwood. It has been found that the result parallels the lignin content. In applying this test a technique is employed which reduces the time required to not over 30 minutes.

Dr. Malcolm N. May, Champion Paper & Fibre Co., Houston, Texas, spoke on "Chemical Reaction Equilibria in the Combustion of Sodium-Base Pulping Liquors." He presented a method for calculating the end result of any of some 40 basic reactions according to any given set of conditions, which determine the thermodynamic relationships. It is important to realize that these apply only to the result *at equilibrium*. The equations shown on slides did not include *rate of reaction*, therefore could not be used to predict results in a given time. At temperatures above 1900F the recovery furnace can form appreciable amounts of metallic sodium, which can release hydrogen from the water in the dissolving tank causing the explosions that are frequently so troublesome. The speaker indicated how to calculate the conditions essential to conversion of Na_2S into Na_2CO_3 with release of H_2S, which can be burned to form SO_2 and this used to react with Na_2CO_3 to form Na_2SO_3, thus forming a neutral sulphite recovery process.

High Yield Featured

Lionel M. Sutherland, Sutherland Refiner Corp., Trenton, N.J., told of "Observations of the Operation of the Sutherland High Yield Kraft System." Described was the system in a northern mill, which had obtained 62 to 64 per cent yield of good quality kraft pulp by interposing Sutherland refiners between the blow tank and washers with a conical refiner ahead of the Sutherlands to catch non-magnetic tramp metal and break up slivers, etc. The system had to be modified to suit conditions peculiar to the South. First, the conical refiners had been replaced with the Sutherland "Breaker-Trap," and the vacuum washer replaced with the pressure type. The latter had proved necessary because of the soap in the more highly resinous black liquor from southern woods, which would seal over the face of the vacuum washer.

The black liquor from high-yield kraft is lower in fuel, but the value of the wood substance in the pulp is from six to eight times what it is as fuel, so this loss is really an economic gain. The total solids in the black liquors from a ton of pulp has been reduced from around 2,400 lbs. to about 1,900 lbs. Also, less chemical is required per ton of product. At one southern mill the yield per 4,300-cubic foot digester had been increased from less than 14 to more than 17 tons, with no reduction in pulp quality. Water finish board made from high-yield pulp has superior finish because of the plasticized lignin on the surface. This high-yield pulp can be bleached to as good color as lower yield kraft, but with higher yield consumption. It would not prove economical to bleach these pulps unless very cheap chlorine were available.

The present annual production of high-yield pulps is about 2,000,000 tons. The over-all saving effected by this higher yield and lower chemical consumption, with due allowance for somewhat higher power requirement, is about $5 per ton of pulp (with wood @ $15 per cord). For a 500-ton-per-day production this is an annual saving of $850,000. In eight months the saving will be equal to the cost of the equipment required. For land of equal productivity, 80,000 acres would support a mill tonnage of high yield kraft for which 100,000 would be required at normal yield.

Presented were charts showing comparison between the composition of normal yield, moderately high yield, and very high yield kraft pulps. These showed:

For yield of	47%	58%	62%
Chlorine No.	3.5	16.1	19.1
Alphacellulose	87.0%	72.7%	70.7%
Hemicellulose	9.7%	12.7%	12.3%
Lignin	1.2%	13.2%	16.0%

The importance of careful temperature control to prevent degradation was especially emphasized.

Malcom B. Pineo of Brunswick Pulp & Paper Co., Brunswick, Ga., spoke on the topic, "Cooking Southern Wood for High Brightness Bleached Sulfate Pulp." He emphasized the importance of the control of all factors from bark removal through careful chip preparation, proper time-temperature control in the digester to good screening and bleaching techniques. If sulfidity is below 15 per cent, the strength will suffer. The best range is from 22 to 25 per cent.

Various Wood Species

The second afternoon session began with a paper by J. N. McGovern, "Semichemical Pulping and Wood Species." Proposed was a classification of woods according to an evaluation based on (1) a work factor, and (2) a pulping factor. These related the amount of chemical cooking, power consumption, etc., required to produce a usable pulp to the amount of lignin removed. A slide showed graphs with "relative pulpability" as ordinates and "% lignin in pulp" as abscissa. Curves for aspen had steeper slope and generally higher pulpability than white oak, while the shortleaf pine curve was still flatter and lower. Each of the curves would pass through the origin, and all tended to become asymptotes of the abscissa. The following classification was given for a few species:

Excellent: Aspen, beech, paper birch, chestnut oak, sweet gum, tupelo, willow.

Good: Post oak, black gum, yellow poplar, sycamore, willow.

Fair: Ash, elm, white oak, hickory, western red cedar.

Poor: White pine, shortleaf pine, old growth Douglas fir.

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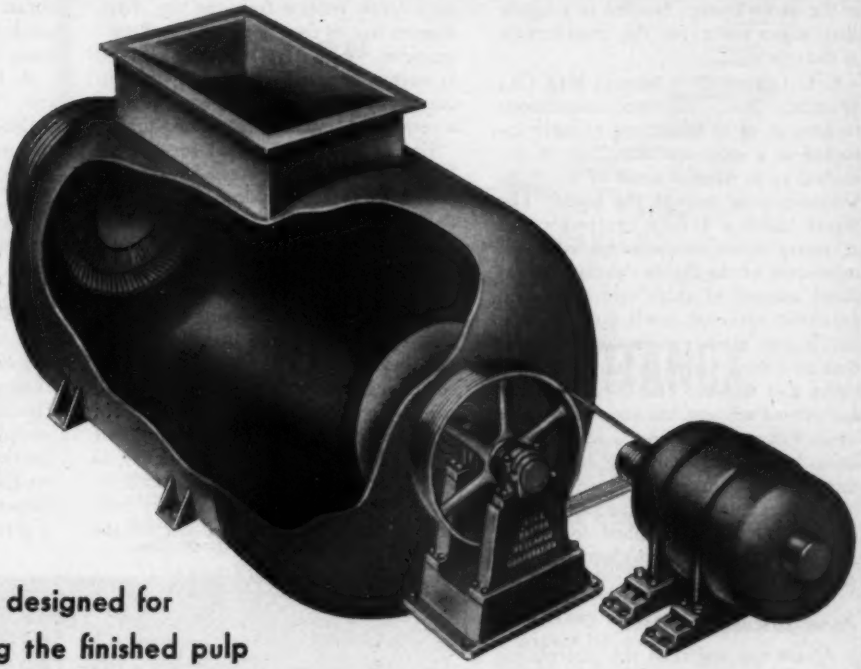

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The DynoPulper is also designed for continuously discharging the finished pulp

THE stock is charged all at one time into the top of the vat. Two DynoPellers (described below) subject it to the vigorous dynomizing action that completely separates each fiber from its neighbor without cutting or shortening and with a small drop in freeness. The simple operating principle and design of the DynoPulper eliminates the "wracking" and grief of other types of pulpers. Because there are few moving parts there is no loss of production time due to repair or adjustment. The DynoPulper defibers the stock at low cost and produces a high quality slurry quickly and effectively.

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The DynoPeller
is the heart of all DynoMachines. Its concave face is lined with rough, hard carbide particles. As the DynoPeller rotates it causes a suction at its center that pulls the stock towards it. Centrifugal force then causes the stock to flow rapidly over the rough carbide particles under a gentle hydraulic pressure. This effective dynomizing action completely disintegrates the stock . . . separating each fiber from its neighbor while maintaining its original length.

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was the title of a paper presented by Richard G. Coker of Sonoco Products Co., Hartsville, S.C. Pioneering efforts of Sonoco were described, with especial emphasis on the problem of corrosion. Sonoco does not use the single flute crush test, but relies on the old Thiele ring crush test.

Paul Lange of the Swedish Forest Products Research Institute, Stockholm, presented a scientific paper on the topic, "Distribution of Cellulose and Hemicellulose in the Cell Wall of Sulfate Pulp in Comparison with Other Pulps." He pointed out that lignin content is naturally higher in the middle lamella than in the outer layers. Needed is a lignin distribution curve for the cross-section of the cell wall.

C. L. Durkee, D. J. Murray Mfg. Co., Wausau, Wis., discussed continuous cooking in M-D equipment recently installed at a southern mill. This he described as in effect a series of small digesters moving through the liquor. The flights inside a U-tube are perforated. A rotary valve synchronized with the movement of the flights delivers a measured amount of chips into each compartment. Although newly put into service, it has already been demonstrated that no difficulty need be feared with the chain and flights. The U-tube portion has proved efficient, but the rotary valve needs improvement, and a new type is being built. Ultimately it is hoped that this equipment may be adapted to cooking high grade alkaline pulps, but the first unit has been applied to neutral sulphite hardwood semichemical pulp only.

Panel Discussion Staged

At the conclusion of the presentation of formal papers, a panel discussion was staged on the various subjects. H. O. Teeple of International Nickel Co. discussed digester corrosion. He declared that metal linings have not been entirely successful because of stress crocking due to the formation of "concentration cells" behind the lining (when breaks occur). An Inconelclad digester has been in use two years with no complaints. Some mills are using carbon brick linings, but there have been some complaints of spoiling near the top. For continuous cooking of neutral sulphite some of the stainless steels appear to be efficient.

Franklin L. Jones, St. Joe Paper Co., told of that firm's high-yield kraft operation. He emphasized that better chip preparation is important. The firm uses 260 lbs. of active alkali per ton cooking, with 3,800 lbs. of steam per ton and gets 16.5 tons per cook. Formerly the yield was 13 to 14 tons.

George Whiteside of Container Corp. of America, Fernandina, Fla., told of that firm's operations. Container gets 14 tons from 4,300-cubic foot digesters; uses circulating pumps but no heater; has motor-operated blow valves; determines liquor volume by chip weight; steams on schedule, a cook blown every 50 minutes; steams @ 2,200 lbs. per hour with the relief valve closed for 50 minutes, then opens the relief valve and reduces the steam input to the normal rate; reaches the cooking temperature (350F) in an hour and 50 minutes; maintains two digesters steaming at once, and blows in 15 minutes. In the past Container had experienced difficulty with burnt cooks because the liquor circulating pump pulled the liquor from the bottom too rapidly. This was corrected by drawing a larger portion from the top. Each digester has its own flowmeter and thermometer, which are frequently checked to maintain accuracy. An error of 1F in one hour and 15 minutes is equivalent to an error of 15 minutes in cooking time.

Use of the attrition mill for refining "rough stock" was described by T. W. Small of Sprout, Waldron Co., Muncy, Pa. More than half of all semichemical pulp is now being processed in Sprout, Waldron mills. R. R. Fuller of Gulf States Paper Corp. presented "A Review of Methods for Determining Degree of Pulping." He declared that there is no good test for degree of cooking, that something must be developed that will tell *during the cook* when the desired purity of cellulose has been attained. If it were possible to devise a quick test to apply to the liquor that would indicate when the correct amount of any substance had been dissolved out of the wood, the situation would be ideal. It should be based on the increase in organic content.

A chart was exhibited showing a possible correlation between lignin content and permanganate number. The curve changed slope as the lignin content increased. Mr. Fuller suggested the use of higher permanganate concentration for more raw pulps. The Tingle (bromine) Number was mentioned, but dismissed as useful only for easy bleaching pulps. A lignin determination would be good if correlated with the lignin content of the wood. But, the manipulation required is tedious and slow. A more rapid and accurate method than is now available is needed. Dye absorption tests look promising, but are not yet fully developed.

A. P. Yundt, Camp Mfg. Co., Franklin, Va., commented that using 0.5NKMnO$_4$ solution and allowing 15 minutes for reaction it is possible to get a linear relationship with the lignin content, *provided* the sample is well defibered. This can be applied to hardwood semichemical pulps as well as on high-yield kraft. If a hand sheet is made, dried, weighed on hot balance, then dispersed in the Waring blender, results will be good and in the 14-16 chlorine number range. Bob Fuller interjected that quick removal of water can be obtained by pouring acetone over the sample in a Gooch crucible and applying gentle suction for a moment. After weighing on hot balance, the sample will disperse readily in water on stirring with a glass rod.

NOTABLES IN THE PAPER INDUSTRY are shown at the speakers' table during the banquet given in conjunction with the symposium on cellulose and lignin held in Montreal. Shown are (L. to R.) Dr. Westbrook Steele, president of the Institute of Paper Chemistry, Appleton, Wis.; Dr. Lincoln R. Thiesmeyer, president of the Pulp and Paper Research Institute of Canada, Montreal; Dr. C. J. Mackenzie, president of the National Research Institute of Canada, who was the principal speaker; D. W. Ambridge, president of Abitibi Power & Paper Co. Ltd., Toronto, and R. L. Weldon, president of Bathurst Power & Paper Co. Ltd., Montreal.

Lignin Discussed at Canadian Meeting

Large-scale utilization of lignin was the goal of discussions held during the September 24-26 International Symposium on Fundamental Chemistry of Cellulose and Lignin at Montreal. Thirty scientists from 14 nations participated in the program, which was sponsored by the Pulp and Paper Research Institute of Canada in cooperation with the National Research Council of Canada, the Chemical Institute of Canada, the Canadian Pulp and Paper Association, McGill University, and Industrial Cellulose Research Ltd. Sessions were staged at McGill University.

Technical papers were presented during the conference's opening day, followed by a roundtable discussion on

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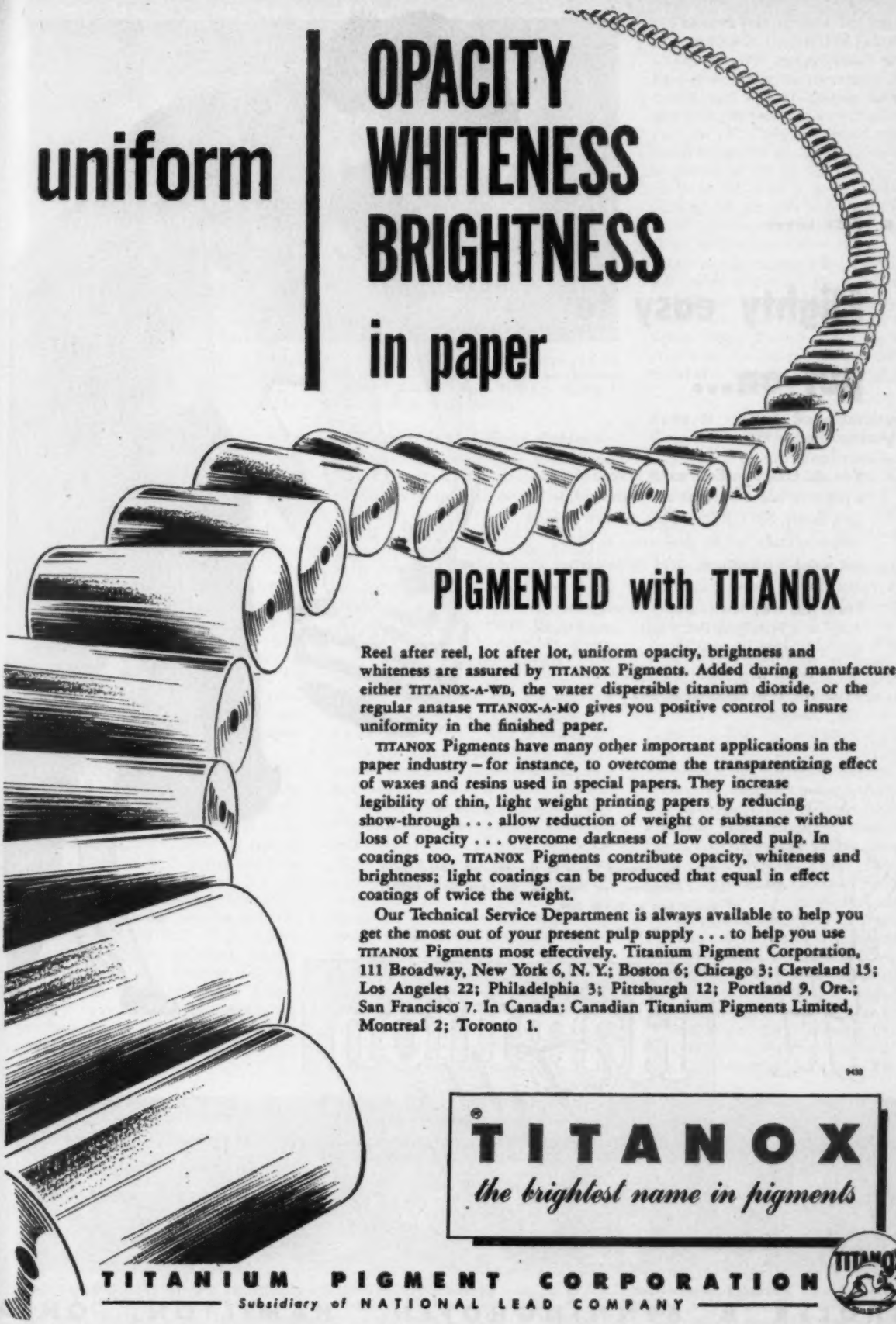

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MOLECULAR CHAIN MODEL used to explain the structure of lignin is demonstrated by Prof. C. Freudenberg of Heidelberg University, Germany, during the symposium on cellulose and lignin. With Dr. Freudenberg are Dr. E. Adler, Swedish Forest Products Research Laboratory, Stockholm, and Prof. O. Kratky of the University of Graz, Austria.

Tuesday. A buffet luncheon and banquet in honor of the foreign guests were held, as was a visit to Industrial Cellulose Research Ltd., Hawkesbury.

Speakers at the meeting included Dr. W. E. Cohen, Division of Forest Products, Australia, whose topic was "Chain Length Distribution Studies on Nitrated Wood and Cotton Celluloses;" Dr. L. Jorgensen, Billeruds Aktiebolag, Sweden, who spoke on "Behavior of Cellulose and Wood Polyoses During Stepwise Hydrolysis and Extraction of Birch and Spruce Holocellulose;" Prof. J. K. N. Jones of the Department of Organic Chemistry, Bristol University, England, who discussed "Origin of the Pentose Sugars."

During the second session, Dr. Herman Mark of the Polytechnic Institute of Brooklyn, N.Y., reported new methods on which science is working to make paper more water resistant. The title of his paper was "New Polymers and their Use Together with Cellulose." Prof. C. Freudenberg of Heidelberg University in Germany spoke on "Natural and Synthetic Lignin," and Prof. C. B. Purves of McGill University discussed "Experiments on the Sulphite Pulping of Spruce Periodate Lignin." "Canada and Science in 1951" was the address presented at the banquet by Dr. C. J. Mackenzie, president of the National Research Council of Canada.

Michigan Supts. Elect Peeters

Richard H. Peeters of St. Regis Paper Co., Kalamazoo, was elected chairman of the Michigan Division of the Superintendents Association for 1951-52 at a dinner held September 20 at the Hotel Harris, Kalamazoo. Other officers chosen at the meeting included Harvey W. Hartman, American Box Board Co., Grand Rapids, first vice chairman; Leo H. Mimms, Kalamazoo Paper Co., second vice chairman, and Dr. Alfred H. Nadelman, Western Michigan College, secretary-treasurer.

Guest speaker of the evening was Lester J. Smith of Gould Paper Co., Lyons Falls, N. Y., who described his firm's operations, assets in the way of power, woodlands and plant facilities, and told of the process used by the mill in making bleached groundwood pulp. The equipment used in the groundwood mill consists of 11 grinders with a capacity of 120 tons per day. The speaker related that the mill is grinding spruce and balsam and some poplar; that the stones are operated at 200 rpm, carry 60 lbs. pressure, and hold temperatures of between 150F and 160F; that the stock after screening is thickened to a consistency of 12 to 14 per cent, then heated to about 110F, and next brought in contact with the peroxide bleaching solution—the retention time in a holding tower being two to three hours.

The stock leaving the tower has a pH of 9 to 9.5 and a residual of peroxide of 10 per cent. It is dropped into a neutralizing chest, where the consistency is controlled and sulphur dioxide added to eliminate the peroxide and alkali to reduce the pH. The groundwood, with an initial brightness of 62, is bleached to a brightness of 70 to 71 with a liquor made up of 4 to 5 per cent sodium silicate, 1.8 per cent sodium peroxide, about 1.5 per cent sulphuric acid, and about .05 per cent epsom salts.

During the meeting a life membership was presented to Otto Fischer, formerly with Bryant Paper Co., Kalamazoo. The presentation was made by O. W. Callighan, Edgar Bros. Co., retiring chairman. Glen Sutton, president of the national association, was an honored guest.

Penn.-N. J.-Del. Superintendents Celebrate 25th Anniversary

Members of the Pennsylvania-New Jersey-Delaware Division of the Superintendents Association celebrated their silver anniversary at Pocono Manor, Pocono Summit, Pa., on September 28 and 29.

Unanimously elected as officers for the coming year were: Chairman, Elmer Mitchell, Glassine Paper Co., Manyunk, Philadelphia; first vice chairman, George M. Suydam, Riegel Paper Corp., Riegelsville, N.J.; second vice chairman, Andrew J. Luettgen, P. H. Glatfelter Co., Spring Grove, Pa.; third vice chairman, Clarence F. Kingston, Hammermill Paper Co., Erie, Pa., and secretary-treasurer, Joseph Paciello, E. I. du Pont de Nemours & Co., Wilmington, Del.

Glen T. Renegar, retiring chairman, was in charge of the meeting. National President Glen Sutton of Sutherland Paper Co., Kalamazoo, Mich., was introduced as a guest. Elmer Mitchell, George Suydam and Andrew Luettgen presided over the technical sessions. Among papers presented were "Practical Operation of the OCO Water System," given by Howard J. Wright of S. Austin Bicking Paper Mfg. Co.; "Meeting the Challenge of Maintenance and Lost Time in the Paper Mill," by Ray Curtis of Scott Paper Co.; "Printing Quality Requirements of Folding Boxboard," by Henry J. Abernathy of National Folding

HEAD TABLE GUESTS AT THE MICHIGAN SUPERINTENDENTS meeting were (L. to R.) L. Paul Newton, Kalamazoo River Improvement Co.; Dr. A. H. Nadelman; L. J. Smith, guest speaker; R. H. Peeters, new chairman; O. W. Callighan, retiring chairman; Otto F. Fischer; Glen Sutton, President of the national association, and Raymond L. Barton of Michigan Paper Co., national association trustee.

Box Co., and "The Relation of Quality Control to Operation," by A. S. Erspamer and K. S. Whisler, both of P. H. Glatfelter Co.

Included in the social program was the regular Peddlars' Breakfast, golf, softball, cocktail party, and banquet. Speaker at the dinner was E. T. A. Coughlin, past national president, who is now with the federal government.

NATIONAL FLEXIBLE PACKAGING ASSOCIATION officers gather at the new organization's first annual meeting. Seated are (L. to R.) Warren W. Young, Roy E. Hanson, William L. Moore, James P. Duffy, Robert E. Pentz, John M. Cowan, and Karl R. Hines; standing, James F. Zorn, Robert S. Jones, Theodore Isen, Fred Hinkle (alternate for Benjamin C. Betner), Harry E. Hallman, William Boas (alternate for Morris Boas), and A. E. Weisberg.

Flexible Packaging Assoc. Elects Officers for 1952

At the first annual meeting of the National Flexible Packaging Association, held recently in New York, N.Y., the following officers were chosen for the coming year.

J. P. Duffy, Union Bag & Paper Corp., president; R. E. Hansen, Milprint Inc., W. L. Moore, Shellmar Products Corp., and R. E. Pentz, Oneida Paper Products Inc., vice presidents; W. W. Young, American Paper Goods Co., treasurer. Directors are Benjamin C. Betner, Benjamin C. Betner Co.; Morris Boas, Flexible Package Co.; H. E. Hallman, Columbia Paper Products Co.; Karl R. Hines, Nashua Gummed & Coated Paper Products Co.; Floyd A. Holes, Floyd A. Holes Co.; Theodore Isen, Paramount Paper Products Inc.; Robert S. Jones, Dobeckmun Co.; A. E. Weisberg, Comet Paper & Envelope Co., and J. F. Zorn, Custom Made Bag Co.

Supts. Hold Fall Meeting at Jacksonville

Reported by R. H. Stevens, Jacksonville

Technical papers on many and varied features of papermaking were presented in conjunction with the joint fall meeting of the Southern and Southeastern Divisions of the Superintendents Association. More than 300 members and guests attended the sessions, which were held October 10-12 at the Hotel George Washington in Jacksonville, Fla.

Officers for the coming year who were elected at business meetings during the convention are as follows: Southern Division—Chairman, J. J. Thompson, Southland Paper Mills, Inc., Lufkin, Texas; first vice chairman, Thomas Shelley Coldeway, St. Joe Paper Co., Port St. Joe, Fla.; second vice chairman, R. W. Burnett, Crossett Paper Co., Crossett, Ark.; third vice chairman, Charles McCarthy, Southern Paperboard Corp., Port Wentworth, Ga., and secretary-treasurer, Jesse C. Bradbury, Southland Paper Mills, Inc.

Southeastern Division — Chairman, Cecil B. Curry, National Container Corp. of Virginia, Big Island; first vice chairman, Vinson K. Shannon, Mead Corp., Lynchburg, Va.; second vice chairman, Clyde G. Jones, Ecusta Paper Corp., Pisgah Forest, N.C.; third vice chairman, T. R. Barnes, Champion Paper & Fibre Co., Canton, N.C., and secretary-treasurer, Robert B. White, Sonoco Products Co., Hartsville, S.C.

Mill visits included trips to three Florida mills: Hudson Pulp & Paper Co., Palatka; Container Corp. of America, Fernandina, and National Container Corp., Jacksonville.

Technical Sessions

In addition to items of operation and mechanical details, which are always on the program of such meetings, many of the papers followed the current trend of focusing attention on ways and means for obtaining greater yields of pulp from the ever increasingly high-priced wood. Wherever mill men gather together these days, this subject is certain to enter their discussions. Back in the days when southern pine pulpwood was readily obtainable at $4 or $5 a cord, less attention was paid to economy in its use. Mill managers were not too concerned with wood consumption figures which did not exceed two cords per ton of air dry pulp. In those times 85 per cent recovery of chemical was above average, and the cost of chemicals received major emphasis. Development of the highly efficient modern recovery system, plus lime re-burning, has lowered the chemical cost, but the cost of pulpwood has more than doubled. It was, therefore, with avid interest that means for achieving wood consumption figures of 1½ cords per ton of pulp of bag or wrapping grade and on down to 1⅜ per ton of board stock were discussed. Representatives of two of the mills related their experiences, and a member of an equipment firm dealt with the subject in greater detail.

High Yield Processes

In addition to high yield kraft, the field of semichemical pulp was also discussed. The program committee was fortunate in obtaining a research associate of the Institute of Paper Chemistry, Appleton, Wis., to introduce the subject. Sidney D. Wells, whose experience in the kraft and other phases of the pulp and paper industry are well and favorably known among the superintendents, went far back to the classical researches of Cross and Bevan in the 1880's for the basis of semichemical pulping. He traced the development along all lines including steamed groundwood, in which some soda ash is used to neutralize wood acids, through neutral sulphite, semi-kraft, high yield acid sulphite, to "cold caustic", etc. In reply to an inquiry, he defined semichemical pulp as "pulp made from wood which had been treated chemically to soften its structure and then been disintegrated mechanically. This includes pulp ground from bolts that had been steamed with the addition of a small amount of chemical, as well as wood chips that have been softened but not completely disintegrated by any kind of chemical treatment, whether hot or cold, continuous or batch, and subsequently treated by any mechanical means to make woodpulp suitable for fabricating into some kind of paper product."

He emphasized especially the current trend toward utilization of hardwoods of lower cost and greater density than the more commonly used softwoods. "Cooking with neutral sulphite at 180 C. (356 F.) will give yields of around 70 per cent of light color pulp suitable for certain grades of book or magazine papers, writing, envelope papers, etc. For corrugating medium, for which light color is not essential, lower temperatures (150-160 C., equivalent to 302-320 F.) and more alkaline liquors may be employed with consequent saving in power and corrosion."

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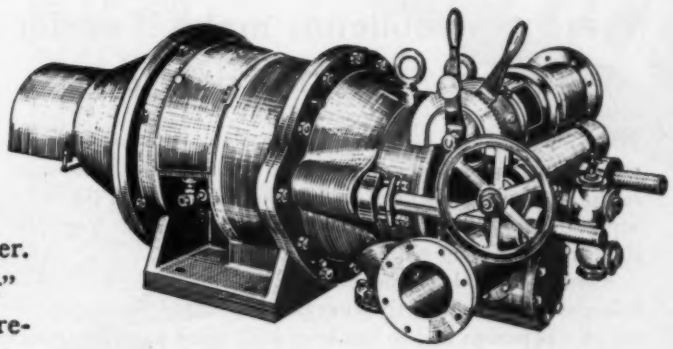

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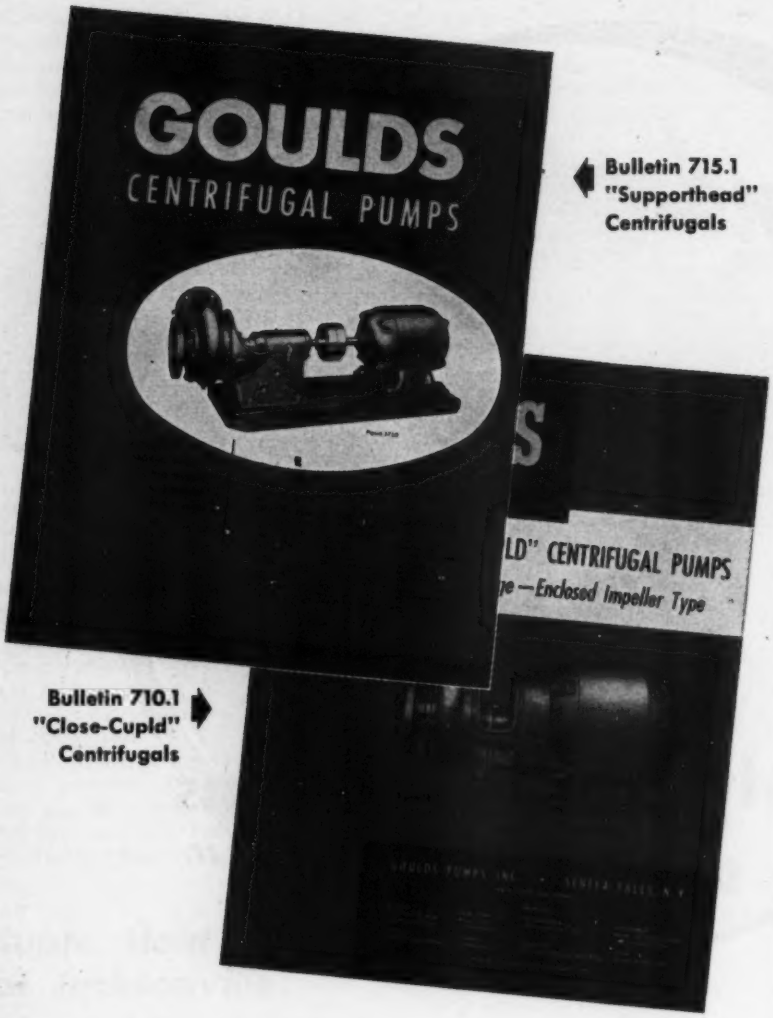

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Semichemical production was discussed still further by Leonard Growden, operating superintendent of Board Mills, Mead Corp., who told of the experience of his company in developing the manufacture of corrugating medium from chestnut chips from which tannic acid had been extracted. Now that this source is nearing exhaustion, other species are being utilized. Chips are cooked in globe rotaries with a liquor containing approximately twice as much sodium sulphite as of soda ash. This liquor is blown off, chips are dumped into a leach caster, from which they are conveyed to attrition mills for fibrillation. Pulp, thus made, is used without washing.

Following his presentation, Mr. Growden called on those present to join in a round table discussion. Unfortunately, there had been no selection of a prepared panel of men with semichemical experience to lead in the round table, and the few questions and comments spontaneously offered failed to measure up fully to the opportunity presented. One gained the impression that those present with any experience in the field probably feared to expose any lack of more complete knowledge before the entire audience.

The subject of higher yields of kraft was introduced by Franklin Jones, technical director, St. Joe Paper Co., who told how his mill had reduced its wood consumption to 1.15 units per ton of container liner. This is equivalent to 1.36 cords per ton of air dry pulp. Of special interest was a slide showing a graph of data for permanganate numbers and chlorine numbers of high yield kraft pulps. He claimed that by employing 60 ml. of p.l normal permanganate, he had obtained results which bore a definite relationship with chlorine numbers for the same pulps. Unfortunately, there were too few points on the graph to be convincing. Of even more interest would have been graphs of both permanganate numbers and chlorine numbers plotted against lignin content of the pulp.

The subject was dealt with more completely by Douglas G. Sutherland, vice president, Sutherland Refiner Corp. He described a method of "Hot Stock Refining" now in use in three kraft mills, one in Canada and two in Florida (Bathurst, St. Joe, and Panama City). He said it is possible to make hot refined high yield pulp, 85% of which will pass through an .008 inch screen. He described the refiner employed for the purpose, which differs from that commonly used for washed stock in being tightly enclosed with the skirt attached to the flume in order to avoid beating air into the stock, causing foam. The only adjustment needed is of the volume admitted. Since the purpose is merely to rub apart the knots and other undisintegrated woody fragments, it is unneces-

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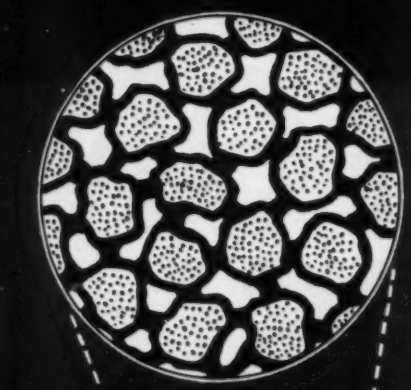

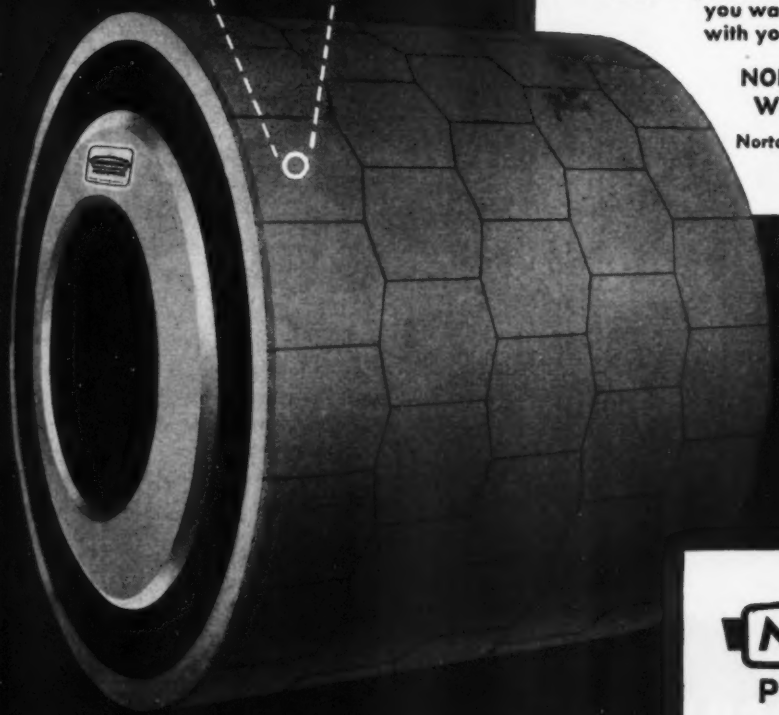

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sary to set the discs at close clearance. "It is important to avoid cutting the hot stock," he said, "for it is very easy to damage the fiber while hot and in the presence of alkaline liquor." At the same time, it is possible to do quite a bit of actual stock preparation before washing. And this can be done more economically (as to power) at this stage than after washing. He cited the Panama City mill as one in which the pre-washer refiner is used for stock preparation, producing a pulp with only 1 or 2 per cent of screen rejects. St. Joe, using their refiners for defibering only, consumes but half as much power in the pulp mill.

Stewart Saunders, paper mill chemist, North Carolina Pulp Co., told of his company's experience with "Pre-Washer Refining of Sulphate Pulp." They have increased their yields, thereby saving both wood and chemicals in getting pulps with permanganate numbers in the 38-42 range. Chemical consumption has been reduced from 600 to 530 lb. of Na20 per ton of A.D. pulp, and wood reduced from 1.7 to 1.46 cords per ton. The first step in their pre-washer refining is to break up knots, slivers and other over-size woody pieces in a Shartle Centrifiner. The pulp then passes through five Sprout-Waldron attrition mills, in parallel. The stock is then washed on two lines of three each 8 x 14 feet single-stage Impco washers.

Other papers which aroused special comment included one on "Wood Preparation, Conveyors and Chipping" by M. J. Farris, pulp mill superintendent, National Container Corp. He described a wood conveyor developed by the late "Judge" W. M. Cary. It differs from the conventional chain conveyor in having a tight trough with perforated horizontal partition. This trough is partly filled with water and the floating logs are pulled along by the drag chain. The latter returns underneath the perforated baffle. Mr. Farris said this requires much less power than either the conventional drag conveyor or the pump-actuated hydraulic flume, and the maintenance is almost nil.

R. W. McCormick, assistant paper mill superintendent, National Container Corp., told of "Experience with Nylon Carrier Rope". He answered three pertinent questions often asked, viz:

1. Danger of damage to the paper machine because of too great tensile strength. "This is overcome," he said, "by choosing a smaller diameter rope which will have about the same tensile strength as the ordinary cotton rope."

2. Excessive cost. "The smaller size nylon, with longer life, actually costs even less per ton of product than the cotton rope."

3. How to make splices. He exhibited a nylon splice which was even simpler than those commonly employed for cot-

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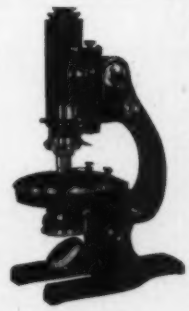

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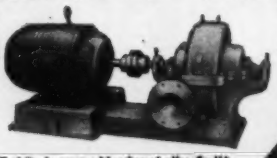

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ton rope, and then demonstrated how singeing the loose ends formed little nodules which prevent slippage in the splice.

Kraft Bleaching

Jesse C. Bradbury, administrative assistant, Technical Service Department, Southland Paper Mills, Inc., read a paper on "Kraft Pulp Bleaching in Four Stages" prepared by Fred W. Bishop, chief chemist of the same company. The paper described the process in use at Lufkin, Texas. In the discussion, the question was raised as to the effect of bleach residues in mill effluent on the stream pollution problem. In reply Mr. Bradbury said the combined mill effluents had little effect on fish life, but admitted there was some popular resentment over increased color of the rather small receiving stream.

Several illustrated talks regarding the manufacture and proper use of mill equipment and supplies were shown. The first of these, exhibited by E. J. Ward, general sales manager, Cameron Machine Co., traced the development of winders and slitters from the earliest crude devices to the most modern high speed machines. Score cut and shear cut slitting methods were illustrated, also, with explanatory comments on the advantages and disadvantages of each. Next, A. G. Howe, Lindsay Wire Weaving Co., showed how fourdrinier wires are woven and told of some "Problems Relating to Fourdrinier Wire Usage." Then, James E. Post, sales engineer, Raybestos-Manhattan, Inc., explained "Pertinent Facts on Rubber Covered Rolls of Interest to Operating Personnel."

An interesting motion picture, with explanatory comment by W. K. Vaughan, Carthage Machine Co., showed how bark is removed in the drum barker. The film showed the effect of interposing baffles over which the pulpwood must tumble. This aids greatly in bark removal. The use of film to analyze the actual operation of wood preparing machinery gives promise of betterment in the design and use of such equipment. Perhaps the difficult problem of bark removal from southern hardwoods, including the oaks, at reasonable cost may be near solution in consequence. Mr. Vaughan also displayed a short film showing how the modern high speed chipper slices off the pulpwood with the slices breaking apart into chips. He foretold that new developments in chip preparation would soon come from this high speed film study.

W. H. Tock, assistant engineer in charge of sales, Allis-Chalmers, told of "Operation and Maintenance of Lime Sludge Kilns". C. H. Belvin, Chromium Corp. of America, gave a fine illustrated

talk on "Electro-Plating and Mill Maintenance".

C. L. Durkee told of the new "M and D Continuous Digester" recently developed by Medura Corp. of which he is president. This consists essentially of a U-tube inside which a conveyor moves wood chips through a cooking liquor. The whole is, of course, under suitable pressure. Raw chips are introduced through a rotary valve, synchronized with the conveyor, at a constant predetermined rate, and cooked chips are ejected into an Asplund Defibrator from which the blow stock goes to a cyclone.

Joe Beckman, Signode Steel Strapping Co., exhibited an interesting motion picture, with oral comment, showing what actually happens when a freight car loaded with rolls of paper is "humped". A flat car on which rolls were loaded and secured by steel bands in various patterns was allowed to run downhill at varying speeds against a "butting block". A study of the effects of the impact clearly demonstrated the advantages of strapping together in a unit all the rolls in one end of a car and the folly of blocking these rolls. By permitting the "unit" to give and then bounce back, the damage is less than if jammed against a floor block.

Coming Events

Feb. 17-21, 1952—American Pulp & Paper Assn., Annual Meeting, Waldorf-Astoria Hotel, New York, N.Y.

TAPPI meetings

Feb. 18-21, 1952—Annual meeting, Commodore Hotel, New York, N. Y.

May 5-8—Third Coating Conference, Sherman Hotel, Chicago.

American Pulp and Paper Mill Superintendents Association meetings

Nov. 30—Pacific Coast Division, New Washington Hotel, Seattle.

Dec. 6—Miami Valley Division. Manchester Hotel, Middletown, Ohio.

June 17-19, 1952—Annual meeting, Book-Cadillac Hotel, Detroit.

Other meetings

Nov. 26-Dec. 1—23rd Exposition of Chemical Industries, Grand Central Palace, New York, N. Y.

Dec. 2-5—Annual meeting, American Institute of Chemical Engineers, Atlantic City, N. J.

Jan. 14-17, 1952—Plant Maintenance Show and Conference, Convention Hall, Philadelphia.

Jan. 23-25—Canadian Pulp and Paper Association, technical session, Mount Royal Hotel, Montreal, Que. (annual meeting).

Feb. 17-20—Regional meeting, American Institute of Chemical Engineers, Biltmore Hotel, Atlanta.

Feb. 18-19—Salesmen's Assn. of the Paper Industry, Annual Meeting, Waldorf-Astoria Hotel, New York, N.Y.

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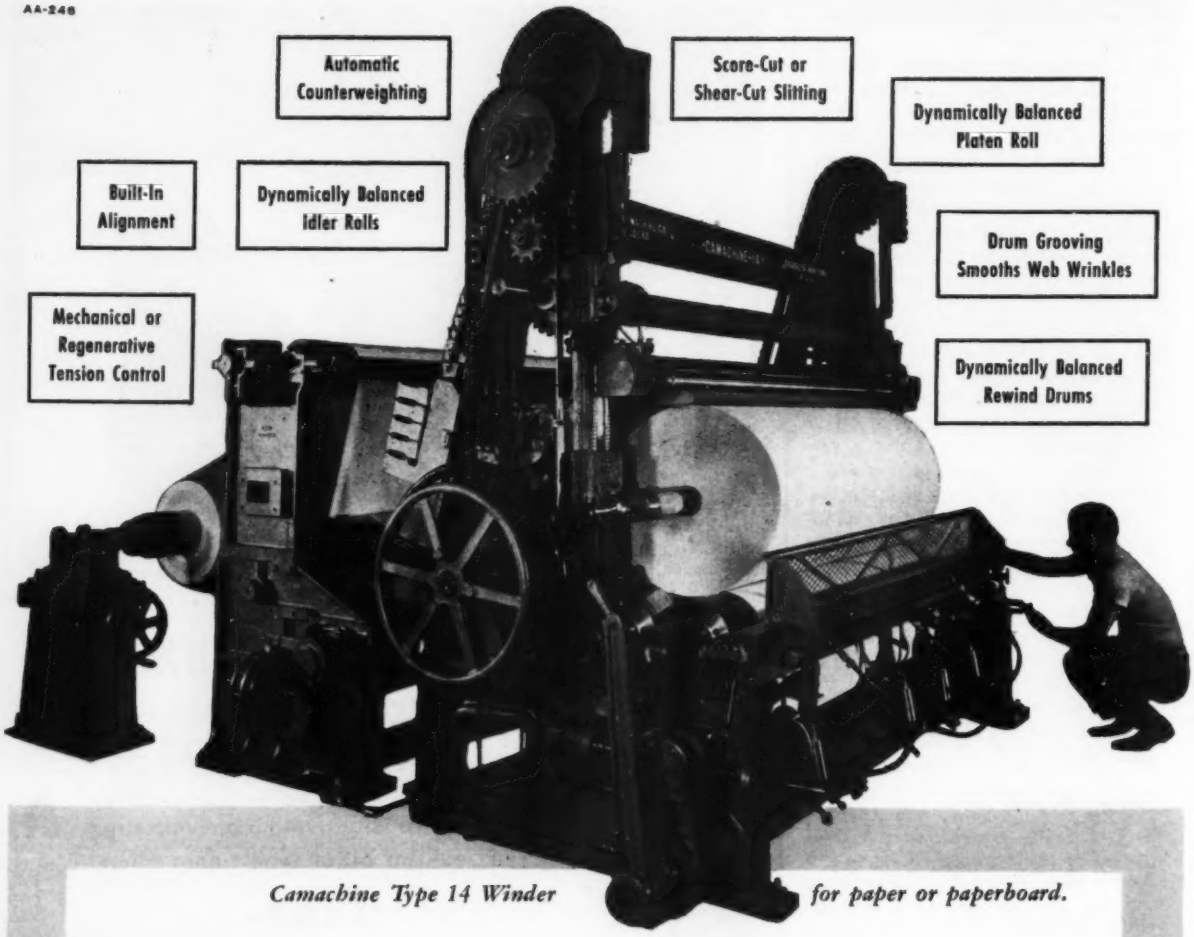

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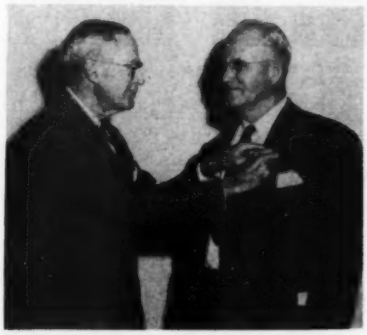

E. T. Gardner and W. E. Sooy

Gardner Executive Marks 20th Year with Firm

Walter E. Sooy, executive vice president of Gardner Board & Carton Co., Middletown and Lockland, Ohio, recently received a service pin in recognition of his 20 years with the firm. Mr. Sooy joined Gardner in 1931 as plant manager. He was named a director in 1937; vice president of operations in 1941. He became executive vice president last year.

His career began in 1907 with Michigan Carton Co., Battle Creek. He later became a director and secretary of that firm, and was also in charge of operations and engineering. Mr. Sooy is a member of the American Society of Mechanical Engineers, past chairman of the Miami Valley Section of the Superintendents Association, and past president of the Cincinnati Club of Printing House Craftsmen.

River Raisin Elects Officers

Arthur J. Goetz was elected executive vice president of River Raisin Paper Co., Monroe, Mich., at the September meeting of the board of directors. Since 1947 Mr. Goetz has held the office of vice president in charge of purchases. He has been with the firm since 1922.

Other officials elected at the meeting include *J. W. Walter,* who was named vice president for finance. He has been secretary-treasurer of the firm and will continue to hold that office. *H. R. McGovern* was elected to the office of vice president for manufacturing. With the firm since 1921, he has recently been general superintendent of the company's container plants.

Four appointments in the River Raisin sales organization were announced recently. *Reinboldt Petersen* was made Ohio regional sales manager with headquarters at Cleveland; *Lawrence P. Jones* was appointed eastern regional sales manager with headquarters at Washington, Pa.; *Roy A. Schellhous* was named Michigan regional sales manager with headquarters in Detroit, and *John E. Trant* was made Illinois regional sales manager with headquarters in Chicago.

D. S. Leslie Elected Trustee of Appleton Institute

Donald S. Leslie, first vice president of Hammermill Paper Co., Erie, Pa., has been elected to a three-year term on the board of trustees of the Institute of Paper Chemistry, Appleton, Wis.

Reelected for three years were *Ernest Mahler,* executive vice president of Kimberly-Clark Corp., Neenah, Wis.; *Sidney Ferguson,* Dayton, Ohio, and *W. Irving Osborne Jr.,* Chicago. *Karl Stansbury,* chairman of the board of Thilmany Pulp & Paper Co., Kaukauna, was reelected as a trustee for a one-year term. He represents Lawrence College on the board.

T. D. Rees has been appointed sales representative for E. B. Eddy Co., Hull, Quebec.

Paul W. Bartholomew has been appointed technical director of the paper division of Minnesota & Ontario Paper Co., International Falls, Minn. In this newly created post Mr. Bartholomew will be responsible for adherence to quality standards in the manufacture of all paper products and in the use of all raw materials except pulpwood. He joined the firm two years ago as assistant paper sales manager at the Minneapolis headquarters.

P. W. Bartholomew

J. A. Patterson

James A. Patterson, formerly with Haskins & Sells, has joined Eastern Corp. in Bangor, Maine, as assistant treasurer. Mr. Patterson, who taught at Northeastern University, Boston, is an expert on taxes and finance.

GOLDEN ANNIVERSARY congratulations are in order for Norman W. Wilson (right), who recently celebrated his 50th anniversary with Hammermill Paper Co. The good wishes are being offered by E. L. Walters, vice president of the Western Newspaper Union.

Hammermill President Observes Fiftieth Year of Service

Norman W. Wilson, president of Hammermill Paper Co., Erie, Pa., observed his fiftieth anniversary of service with the firm November 9. He became head of Hammermill in 1940 shortly after the death of Ernst R. Behrend, cofounder and first president.

Beginning as a mail boy and clerk in 1916, Mr. Wilson worked his way up through the ranks with successive service in the payroll, billing, traffic, and sales departments. In 1913 he was made manager of sales, becoming a vice president in 1914. Mr. Wilson was named first vice president and gen. mgr. in 1929.

In 1915 he helped to establish the sulphite bond division of the Writing Paper Manufacturers' Association, and was chairman until 1920. He served as president of the Association from 1921 through 1923, and was elected vice president of the American Paper and Pulp Association in 1921. Mr. Wilson was made president of the latter organization in 1926. He was a member of the board of directors of the National Association of Manufacturers from 1941 to 1947.

In addition to being president of Hammermill, Mr. Wilson is president of Grays Harbor Pulp & Paper Co., Hoquiam, Wash., a director of that firm and of U.S. Envelope Co.

H. P. Petzold has been appointed mill manager of the West Carrollton, Ohio, plant of Oxford Miami Paper Co. He

has been assistant mill manager since 1950. Mr. Petzold replaces *Philip L. Hovey,* who has been transferred to the New York, N.Y., offices as staff production manager. At the same time it was announced that *Bernard L. Merriss* has been promoted to plant engineer at West Carrollton.

John C. Fogarty and *O. A. Eckhardt* have been named assistants to John B. Kohl, general sales manager of Northern Paper Mills, Green Bay, Wis. Completing the sales department staff is *Robert J. Turek,* who is to serve as advertising manager.

Maj. Elliott A. Compton, formerly divisional sales manager of Scott Paper Co. in charge of industrial sales for the Midwest, has been transferred to Japan from the Wright-Patterson Air Force base at Dayton, Ohio.

Robert L. Smith, president and general manager of the Charleston, W. Va., *Gazette,* has been elected vice president of the Hennepin Paper Co., Little Falls, Minn. *Sterling Graham* of the Cleveland *Plain Dealer* was reelected president of the corporation.

Solvay Appoints New Managers

The appointment of new sales and branch managers for several departments and district offices has been announced by the Solvay Sales Div. of Allied Chemical & Dye Corp. *Neal M. Draper,* formerly manager of Solvay's St. Louis branch, moves to the New York, N.Y., offices as manager of the ammonium and potassium products department. *Harry R. Stoothoff,* who has been assistant manager of the Chicago branch office, becomes manager of the special alkalies and cleansers department. *Verne W. Aubel Jr.* is advanced from supervisor to manager of the calcium chloride department.

E. J. Seener succeeds Mr. Draper as branch manager at the St. Louis office, where he has been assistant manager for the past four years. *A. Benjamin Kennedy* is the new manager at Solvay's Detroit branch, succeeding *Arthur Phillips Jr.,* who will fill the newly created post of assistant to Solvay's director of sales.

R. D. Weant

R. Burdeshaw

H. A. Raymond

Dr. E. V. White

Personnel Changes Announced by Libbey-Owens-Ford

Promotion of *Donald Delaney* to sales manager for coating resins and of *Victor W. Ginsler* to assistant sales manager for that group of products has been announced by the Plaskon Div. of Libbey-Owens-Ford Glass Co., Toledo, Ohio. Mr. Delaney was formerly assistant sales manager, while Mr. Ginsler headed the coating resins technical service.

Four changes have been made in the glues and industrial resins sales organization of the Plaskon Div. *H. A. Raymond Jr.,* special assistant to the general manager, has been made sales manager for industrial resins and will supervise national sales of Plaskon urea and phenolic glues. He succeeds *David B. Hatcher,* who has resigned to become general manager of Stepan Chemical Co., Chicago. *Ralph W. Burdeshaw,* formerly sales representative in the South, has been made southern sales manager for industrial resins, while *Robert D. Weant* has succeeded Mr. Burdeshaw in the field.

Donald R. Baker has been elected president of Asam Wallpapers, Inc., Philadelphia. *Frederick D. Gerhard* was appointed vice president, while *Miss M Huber,* secretary-treasurer, was elected a director.

Norman A. Coan, manager of the sales control division of Marathon Corp., Menasha, Wis., has been appointed a member of the committee on research of the National Association of Cost Accountants.

Carl L. Wild recently assumed duties as secretary and treasurer of Arrow Carton Co., Milwaukee.

Dr. Elwood V. White, formerly professor of chemistry at the University of British Columbia, has been named research associate and group leader in the field of carbohydrate chemistry at the Institute of Paper Chemistry, Appleton, Wis. A graduate of the University of Toronto and McGill University, Dr. White was for a time research chemist for Dow Chemical Co., Midland, Mich., after which he taught at the University of Idaho and Washington State College. He is a fellow of the Chemical Institute of Canada and a member of the American Chemical Society.

John W. Forester, vice president and general manager of Standard Paper Co., Milwaukee Div. of Butler Co., recently marked his fiftieth year with the firm.

Wilm Named Chief of Forest Influences for U. S. F. S.

Harold J. Wilm, in charge of flood control surveys at the Pacific Northwest Forest Experiment Station in Portland, Ore., has been appointed chief of the Division of Forest Influences in the Washington, D.C. office of the U.S. Forest Service. He succeeds Edward N. Munns, who retired August 31.

In his new post Mr. Wilm will coordinate research activities in watershed management, flood control and the relation of climate, soil and water to forests. Studies are carried out through 13 forest and range experiment stations in the U.S., Puerto Rico, and Alaska.

Mr. Wilm joined U.S.F.S. in 1932 at the Cass Lake branch of the Lake States Forest Experiment Station in Minnesota. He later helped to install rain measurement systems at the San Dimas Experimental Forest in California. In 1938 he was put in charge of the Forest Influ-

H. R. Stoothoff

A. Phillips Jr.

V. W. Aubel

N. M. Draper

E. J. Seener

A. B. Kennedy

heat transfer problems
. . . pre-solved !

Operators of paper mills . . . builders of paper making machines . . . both can gain a direct solution to a multitude of heat transfer problems by the application of Ross Exchangers.

The Ross technique of mass producing standardized components and sub-assemblies into pre-engineered designs and sizes has pre-solved the heat removal problems of lube oil in calendering machines, pulp refiners, large centrifugal pumps, turbines; of hydraulic oil in control panels of drying machines — has pre-solved many other paper mill heat transfer applications such as digester circulating heaters or acidified water coolers.

For the machinery manufacturer, this means a ready solution of his heat transfer problems with units of standardized simplicity — for quick, simplified installation; units of proved performance, for positive protection of his reputation. For the mill operator, faced with the similar problems in processing, or on machinery where the heat transfer problem has not already been solved by the equipment manufacturer, it likewise means a prompt and direct solution.

Either way . . . mill operator or machinery manufacturer . . . look to Ross for the pre-solved answer to your heat transfer problems. Write in detail and literature directed specifically to your needs will be mailed promptly. At your request, too, the Ross engineer in your locality will arrange to consult with you and your engineers.

ROSS HEATER & MFG. CO., INC.
Division of American Radiator & Standard Sanitary Corporation
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In Canada, Horton Steel Works, Limited, Fort Erie, Ont.

Serving home and industry
AMERICAN-STANDARD · AMERICAN BLOWER · ACME CABINETS · CHURCH SEATS · DETROIT LUBRICATOR · KEWANEE BOILERS · ROSS HEATER · TONAWANDA IRON

ences Div. in the Rocky Mountain area and in 1948 was transferred to the Southern Experiment Station at New Orleans.

Adolph Dorfman of A. Dorfman & Co., New York, N.Y., has been elected president of the New York Metropolitan Div. of the National Paper Box Manufacturers Association.

Sam Littlejohn of Phladelphia has been elected commercial vice president of General Electric Co. He was formerly manager of the Atlantic district office of the firm's apparatus organization.

Major Appointments Announced by Hooker Electrochemical

Bjarne Klaussen has been elected executive vice president of Hooker Electrochemical Co. Since 1947 he has served as vice president in charge of production for all Hooker plants. Mr. Klaussen has been with the firm 35 years.

Another recent Hooker appointment was that of *Donald E. Springer,* who became chief engineer October 1. He joined the company in 1936 and has been assistant chief engineer since May of this year.

Promotions within the firm were announced by Mr. Klaussen shortly after his appointment as executive vice president. *Thomas E. Moffitt,* with Hooker since 1950, was made works manager of the Tacoma, Wash., plant, succeeding John D. Rue, retired. Other promotions at the Tacoma plant include the following: *George Gentes* to plant engineer, succeeding Howard D. Norris, retired; *Edwin A. Adams* to purchasing agent; *Chester D. Roberts* to traffic manager, and *Russell Hansen* to master mechanic.

In the sales department of the Hooker Co., *Harris C. Miller* has been assigned to territory covering upper New York state and western Pennsylvania. A graduate chemical engineer, he has been with the firm since 1941.

Why Paper Makers Specify SOLVAY...
SOLVAY KNOWS PAPER MAKING ... its methods ... its needs ... and its problems. This knowledge of the paper industry is no mere accident, for SOLVAY has worked closely with paper makers for over fifty years —longer than any other alkali manufacturer!
AND THE SPECIALLY TRAINED EXPERTS on the SOLVAY Technical Service staff stand ever ready to help you with the uses and applications of any SOLVAY product. SOLVAY's chain of warehouses and stock points—as well as strategically located manufacturing plants—are further aids to efficient operation of your business.
ADD THESE TOGETHER—long experience, technical knowledge and dependable supply of essential chemical materials—and you'll know why paper makers specify SOLVAY.
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BRANCH SALES OFFICES:
Boston • Charlotte • Chicago • Cincinnati • Cleveland • Detroit • Houston
New Orleans • New York • Philadelphia • Pittsburgh • St. Louis • Syracuse
SOLVAY
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70 YEARS OF SERVICE
1881
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Chemicals for the Paper Industry
LIQUID CHLORINE
CAUSTIC SODA
SODA ASH
Caustic Soda • Caustic Potash • Chlorine • Potassium Carbonate • Nytron • Calcium Chloride • Sodium Bicarbonate • Specialty Cleansers • Sodium Nitrite
Soda Ash • Ammonium Bicarbonate • Para-dichlorobenzene • Ortho-dichlorobenzene • Monochlorobenzene • Methanol • Ammonium Chloride • Formaldehyde

Theodore E. Kloss of Hollingsworth & Whitney Co., Waterville, Maine, was recently made assistant manager of Northern Mills. He joined the firm in 1949. Previous to his present association Mr. Kloss was general superintendent of Ryegate Paper Co., E. Ryegate, Vt.

T. E. Kloss

A. H. Adams

Albert H. Adams, with headquarters at South Portland, Me., has recently become the representative for Bauer Bros. Co., Springfield, Ohio, for the New England territory. Prior to World War II he worked as technical assistant to the kraft mill superintendent of West Virginia Pulp & Paper Co., Covington, Va.

Theodore E. Knowlton, Watertown, N.Y., paper manufacturer and an 1893 graduate of Rensselaer Polytechnic Institute, has been elected an honorary trustee of the Institute's engineering school.

N. W. Cook, formerly secretary, has been elected executive vice president and general manager of Brown Paper Goods Co., Libertyville, Ill. *John Rossdeutcher,* until recently associated with Bowman Dairy Co., has been named secretary, general production manager, and personnel director.

R. F. Caldwell, secretary and treasurer of E. B. Eddy Co. and of Eddy Paper Co. Ltd., has been appointed a director of Sidney Roofing & Paper Co. Ltd., Victoria, B.C. a wholly-owned subsidiary of E. B. Eddy Co.

HANCHETT GK KNIFE GRINDER

TABLE DRIVE

HYDRAULIC

ELECTRICAL

Full Automatic

SPEEDS FROM 10 to 80 FT. PER MINUTE
Faster Speeds If Required

CAPACITY 32 to 184 inches

OTHER MODELS

DN FOR LIGHT PRODUCTION CAPACITY *32" to 108"*

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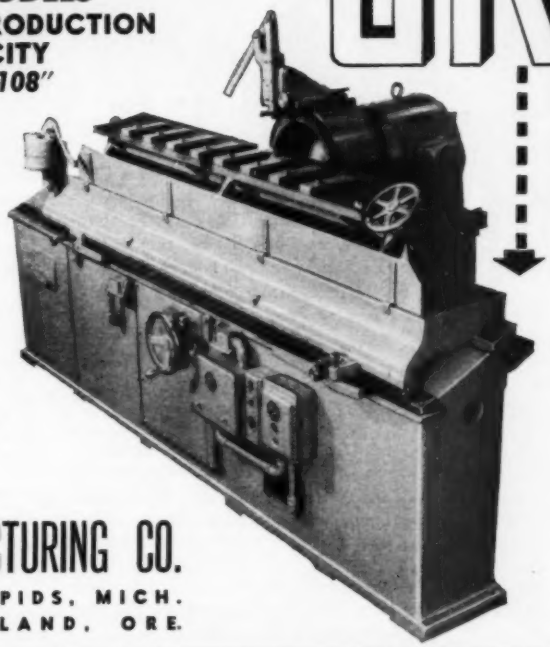
FAMOUS TRAVELING WHEEL HEAD GRINDER. Hydraulic and Mechanical Transmission Drive. Capacity 84" to 360" and longer. Speeds 10' to 100' per minute—Faster speeds if required. 3-Month Delivery in all lengths.

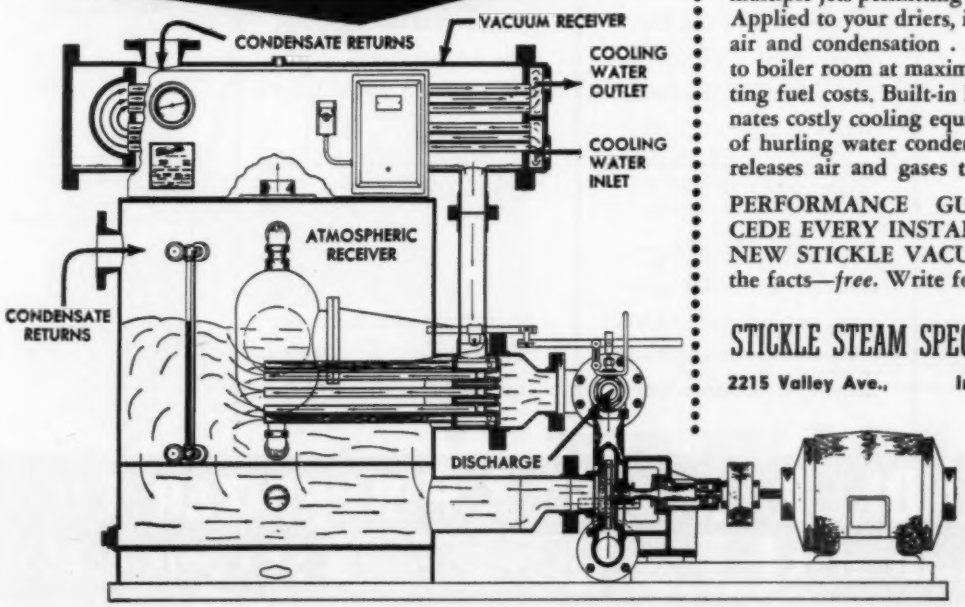
World's Largest Manufacturers of Knife and Shear Blade Grinders . . . Famous RED ANCHOR Grinding Wheels—Segments—Dressers—Cutters—Compound.



HANCHETT MANUFACTURING CO.

Main Office: BIG RAPIDS, MICH.
West Coast: PORTLAND, ORE.

LET'S LOOK INSIDE
the new STICKLE Vacuum Pump



● Count the many advantages in design offered by this new Stickle Vacuum Pump. Note, especially the *accessibility* of every vital part. Floats housed in *exterior* float boxes. Interchangeable vacuum chamber located *above* tank. Easy access to ejector tubes. Standard horizontal motor and pump.

Unit is designed for vacuums up to 28", with multiple jets permitting stepped up capacities. Applied to your driers, it will rapidly remove air and condensation . . . return condensate to boiler room at maximum temperature, cutting fuel costs. Built-in heat exchanger eliminates costly cooling equipment. Recirculation of hurling water condenses flash vapors and releases air and gases to atmosphere.

PERFORMANCE GUARANTEES PRECEDE EVERY INSTALLATION OF THIS NEW STICKLE VACUUM PUMP. Get all the facts—*free*. Write for Bulletin 600.

STICKLE STEAM SPECIALTIES COMPANY

2215 Valley Ave., Indianapolis 18, Indiana

E. L. Crowley, formerly bleach plant superintendent of Northwest Paper Co., Cloquet, Minn., has recently accepted a position with Infilco Inc. His headquarters will be at the firm's Chicago offices.

E. L. Crowley

A. J. Shradel

A. J. Shradel, manager of the Fresno, Cal., sales office, has been appointed manager of the Seattle district office of Cutler-Hammer, Inc., Milwaukee. He succeeds *T. N. Bristow,* who is retiring after 25 years' service.

Leonard Levy has been named controller of Mason Envelope Co., New York, N.Y.

F. William Koehl of Cincinnati has been elected president of the Midwest Division of the National Paper Box Manufacturing Association.

A. W. Reynolds

E. W. Haley

H. W. Gleichert

F. Clawson

Columbia-Southern Chemical Corp., a subsidiary of Pittsburgh Plate Glass Co., has announced several important appointments in the sales organization. *H. W. Gleichert* has become assistant to the vice president in charge of sales; *E. W. Haley,* formerly located in New York, N.Y., has moved his headquarters to Pittsburgh as director of sales, while *A. W. Reynolds* has been made administrative assistant to the vice president in charge of sales.

John Rigby Jr. has resigned as safety director of the Strathmore Paper Co. mills in Woronoco, Mass., to become associated with Jackson Steiner Co., Hartford, Conn.

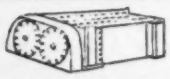
Peter A. Clarke, Chicago, has been named Milwaukee district sales manager for Scott Paper Co., Chester, Pa.

Frank Clawson has been appointed sales representative for Draper Felt manufactured by Draper Bros. Co., Canton, Mass. Mr. Clawson, whose headquarters will be at Kalamazoo, Mich., will cover Midwest mills.

Bert L. Pearce has been appointed chief engineer of the Ewart plant, Indianapolis, for Link-Belt Co., Chicago. He succeeds *Charles R. Weiss,* who has retired after 42 years' service. *Russell T. Sweeney* has been named assistant chief engineer.

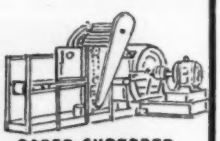
William J. Oleson Jr., controller of Brown Co., Berlin, N.H., has been elected to membership in the Controllers Institute.

Walter M. Ralph, director of research and development for the past 22 years,



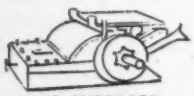
HOT LIME BREAKER

No better time to consider Gruendler Pulp & Paper Machinery

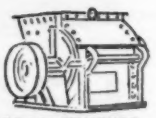


PAPER SHREDDER

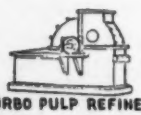
INTENSIVE BLENDER



LAP SHREDDER



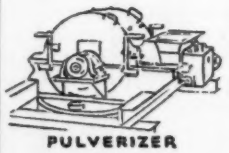
COAL CRUSHER



TURBO PULP REFINER

BARK & WOOD SHREDDER

RAG SHREDDER



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Because: All-Out Pulp Production is "the order of the day". Heavy duty, 24-hour per day, powerful Machinery is required.

Because: Gruendler Machinery is efficient. Embodies many new, yet proved, ideas. Innovations that greatly simplify production steps.

Because: The theme of all Gruendler Machinery is labor saving, low maintenance costs and attaining High Pulp Quality.

Because: A staff of experienced Engineers is ready to analyze problems; make test runs; recommend the right equipment to do the job.

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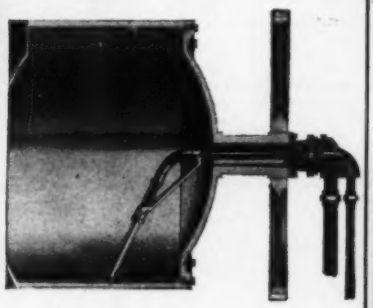
2915 North Market St. *Write for descriptive literature regarding any Machine of interest* St. Louis 6, Mo.

Double Barrel Reason

Reaction of ¾" Auto-Flex in 48" dia. dryer. Very low leverage.

Reaction of ¾" ordinary bent pipe. Syphon in 48" dia. dryer. High leverage.



for using Midwest Auto-Flex Syphons

Midwest Auto-Flex syphons have been on the market for years and many thousands are in service for two very excellent reasons—they hold their position—they wear indefinitely.

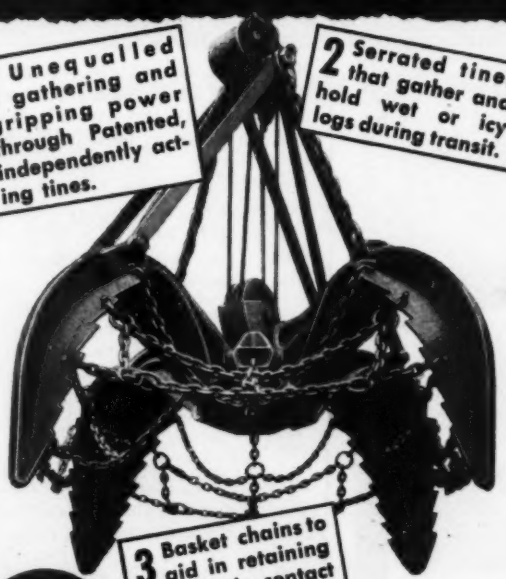
1. The spring and brace holds the end of the pipe at the proper distance from the bottom of the dryer. It cannot possibly take any other position — hence, proper water and air removal.

2. The cantilever leverage exerted is lower than with bent pipe syphons, only 170# vs 354#. It clears instead of dragging on the journal and rapidly wearing out.

Order a get acquainted dozen. Performance as stated guaranteed.

Midwest-Fulton Machine Company **Dayton • Ohio**

Features that favor OWENS



1 Unequalled gathering and gripping power through Patented, independently acting tines.

2 Serrated tines that gather and hold wet or icy logs during transit.

3 Basket chains to aid in retaining logs not in contact with tines.

The OWEN Pulpwood GRAPPLE

THE OWEN BUCKET CO.

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ATKINS

Silver Steel

CHIPPER KNIVES

for every requirement

ATKINS

Leading pulp and paper mills have discovered that Atkins *"Silver Steel"* chipper knives *produce the most uniform chips!* But that's not all. They grind faster and easier. They stay sharp longer. They have minimum chipping. And they are available for any machine with any type of fastening you desire. It will pay you to get the facts—to compare results. Because, as a result, you'll specify ATKINS!

CIRCULAR PAPER SLITTERS and PAPER KNIVES

Noted for long, continuous runs, Atkins *"Silver Steel"* paper knives are made of the finest steel, perfectly tempered. They are scientifically ground on precision machines to assure extreme accuracy! Atkins men in the field keep in constant touch with thousands of users—checking results, solving difficulties, seeking improvements. It keeps *Atkins Always Ahead!*

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Sales Offices: Atlanta • Chicago • Portland • New York

ATKINS

has been made assistant to the president of the National Aniline Div. of Allied Chemical & Dye Corp. Mr. Ralph contributed to advances in Azo color chemistry at a time when replacement of German dye intermediates was critical to industry in the United States.

Dr. Carl Wagner, visiting professor of metallurgy at the Massachusetts Institute of Technology, recently received the first Palladium Medal Award of the Electrochemical Society, Inc. Dr. Wagner was given the award in Detroit ceremonies for "outstanding achievements in the study of corrosion of metals and its control."

William G. Henry, formerly carton sales manager of United Board & Carton Corp. in Syracuse, N.Y., has been named manager of the firm's entire carton sales division.

Carl H. Luth has been appointed sales manager of the Ward Paper Co., Merrill, Wis. Mr. Luth, who has been with the firm 14 years, will remain secretary of the company but will relinquish his manufacturing duties.

Gordon Petrie has been appointed western sales manager of the Black-Clawson, Shartle, Dilts organization. He succeeds his father, the late R. T. Petrie,

G. Petrie

D. L. Stark

who established the West Coast B-C office in Portland in 1946. Gordon Petrie joined the firm in 1948, having previously been employed by Puget Sound Pulp & Paper Co. and Longview Fibre Co. Another Black-Clawson appointment was that of *Don L. Stark,* who has been made northern sales manager, with headquarters in Appleton, Wis., where the firm just recently established offices. He was formerly a sales engineer representative in Wisconsin, Minnesota, and northern Michigan.

Brown Co. Announces Changes

Major changes have been made in the company relations department of Brown Co., Berlin, N.H. The department was formerly under the direction of *Dr. Arnold E. Hanson,* who resigned recently to take a position with the University of Toledo.

H. P. Burbank, with the firm since 1925 and recently assistant to Dr. Hanson, has been promoted to the position of manager of personnel and public relations. He will be in charge of recruitment and administration of salaried personnel, as well as the divisions of safety, medical, and public relations.

W. L. Given has been promoted to the position of manager of industrial relations and will be in charge of all mill union contacts and of mill personnel men. In addition, he is to assume responsibility for the Employment Division, which handles recruitment and placement of hourly-paid personnel. Mr. Given joined Brown Co. in 1922 and prior to his recent promotion was industrial relations supervisor.

Eugene O. Hanson, formerly New England representative of the Paper Sales Div. of Brown Co., Berlin, N.H., has been made assistant manager of the Paper Div. He joined the company in 1925.

Duncan G. Grant has joined the merchandising and sales promotion department of Dow Chemical of Canada Ltd.

Union Bag & Paper Corp. has announced the following changes in the Corrugated Container Sales Div.: *R. Carl Chandler,* former Trenton district sales manager, has been appointed eastern sales manager; *Mayne Madison Jr.,* former Chicago district sales manager,

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Fourdrinier Wire Cloth
is babied throughout
its manufacture
This wire is being rolled up preparatory to packing. It is literally being "handled with gloves". Close inspection by four pairs of eyes takes place simultaneously. This operation is typical of the positive "babying" which marks every step of Lindsay manufacture.
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Lindsay WIRES

For superior quality and uniform performance...

OK BRAND

STARCHES

OK BRAND STARCHES for tub and beater sizing are of highest quality, uniformly maintained.

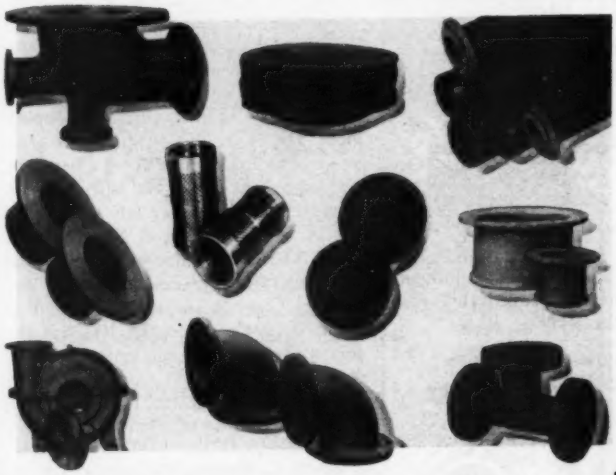
AT YOUR SERVICE! The Hubinger technical staff and laboratories are widely recognized for their thorough and practical knowledge of the use of starch in making paper. Their experience assures you of the *best* product, *tailor-made* to fit *your specific needs*. Consult us on any production problem —at no obligation, of course.

THE HUBINGER COMPANY
KEOKUK, IOWA • • • EST. 1881

MISCO *Stainless Steel* CASTINGS

CORROSION RESISTING · HEAT RESISTING · WEAR RESISTING

WHENEVER YOU NEED *Stainless Steel* CASTINGS



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MISCO offers sulphite pulp and paper manufacturers a dependable source for stainless steel castings in smooth cast condition or machined to a high degree of precision.

We will gladly furnish you with information as to proper analysis, design, and application of stainless steel castings to resist corrosion, heat and wear. Bulletins and engineering data sheets available upon request. Let us know your needs.

CENTRIFUGALLY CAST STAINLESS STEEL PIPE AND TUBES • LARGE & MEDIUM WEIGHT STAINLESS STEEL CASTINGS • CENTRIFUGAL CASTINGS

ALLOY CASTING DIVISION
Michigan Steel Casting Company
1999 GUOIN ST. · DETROIT 7, MICH.
MISCO
One of the World's Pioneer Producers and Distributors of Heat and Corrosion Resisting Alloys

has been appointed western sales manager; *John Butler,* former Atlanta district sales manager, has been made southern sales manager; *F. W. Pettengill* is to be assistant manager in the East, while *J. A. Biggins* will have a similar post in the West.

True M. Avery has retired as vice president and manager of the machinery design department of Union Bag & Paper Corp., New York, N.Y. He joined the firm in 1907.

Sorg Paper Co. has announced the transfer o three men associated with the sales staff. *W. T. Baum,* who has been representing the firm in the territory north and west of Chicago, has been moved into the Chicago market. *R. R. Wilhelm,* Sorg representative in the south and southeast, will also work out of the Chicago office. *R. A. Broeren* is to replace Mr. Wilhelm.

Albert W. Luhrs of South Orange, N. J., has been appointed executive manager of both the National Paperboard Association and the Fibre Box Association.

Babcock & Wilcox Tube Co., Beaver Falls, Pa., has announced two personnel changes in sales offices in the Southwest. *J. H. Roach,* formerly located at the Tulsa, Okla., office, has been transferred to the Houston, Texas, office as assistant sales manager. *W. C. Mohrman,* formerly located in Houston, was transferred to Tulsa and named a district salesman.

Fox Paper Co., Lockland, Ohio, has announced the reelection of the following directors: *J. J. Rowe, H. W. Nicholas Sr., C. H. Walker, H. C. Krannert, Charles A. Hinsch Jr., William H. Mooney* and *H. W. Nicholas Jr.*

Eugene E. Schneider has joined the power department of the Nekoosa-Edwards Paper Co. mill at Port Edwards, Wis. A graduate in mechanical engineering, Mr. Schneider was for a time with Babcock & Wilcox Engineering Co.

Michael Pope has recently been admitted as a junior partner in the firm of Myers & Addington, New York, N.Y., consulting engineers.

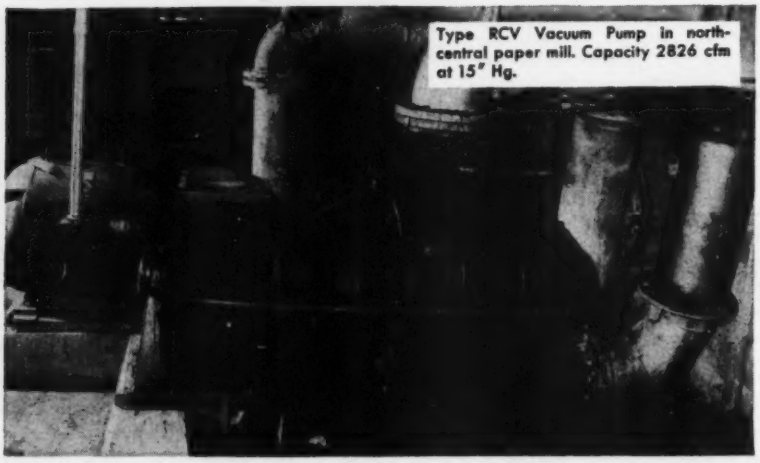
C. M. Sigvardt (above left)

E. Nissen (above right)

W. W. Tolley (left)

Nekoosa-Edwards Paper Co., Port Edwards, Wis., has announced the appointment of three new men, two in the operating department of the Nekoosa mill and one in the purchasing department. *Dr. Charles M. Sigvardt,* a graduate of the Institute of Paper Chemistry, Appleton, has joined the operating department. He was formerly a technical control expert with Scott Paper Co. *Edward Nissen,* a graduate of the College of Forestry of Syracuse University and formerly chemist in the kraft mill of Camp Mfg. Co., Franklin, Va., has also joined the Nekoosa mill operating staff. *William W. Tolley,* formerly with U.S. Gypsum Co. at Chicago, has been named to the purchasing department.

Irving C. Barnes, head of the cost and statistical department of Strathmore Paper Co., West Springfield, Mass., has been appointed a member of the Committee on Research of the National Association of Cost Accountants.



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MUSTS

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SHOPPING LIST

You'll get top vacuum pump performance when you install R-C equipment with these 5 essential features:

1. **LOW POWER CONSUMPTION**—because units are recommended, either single or compound, to operate at the most efficient point.
2. **NEGLIGIBLE FRICTION LOSSES**—no contact between impellers or impellers and casings.
3. **HIGHER SPEEDS**—permitting direct connection to standard motors, saving first cost, space and weight.
4. **FLEXIBILITY**—to meet varying demands; suction automatically overcomes resistance in system.
5. **DEPENDABILITY**—long-time, attention-free operation, due to simplified design and construction.

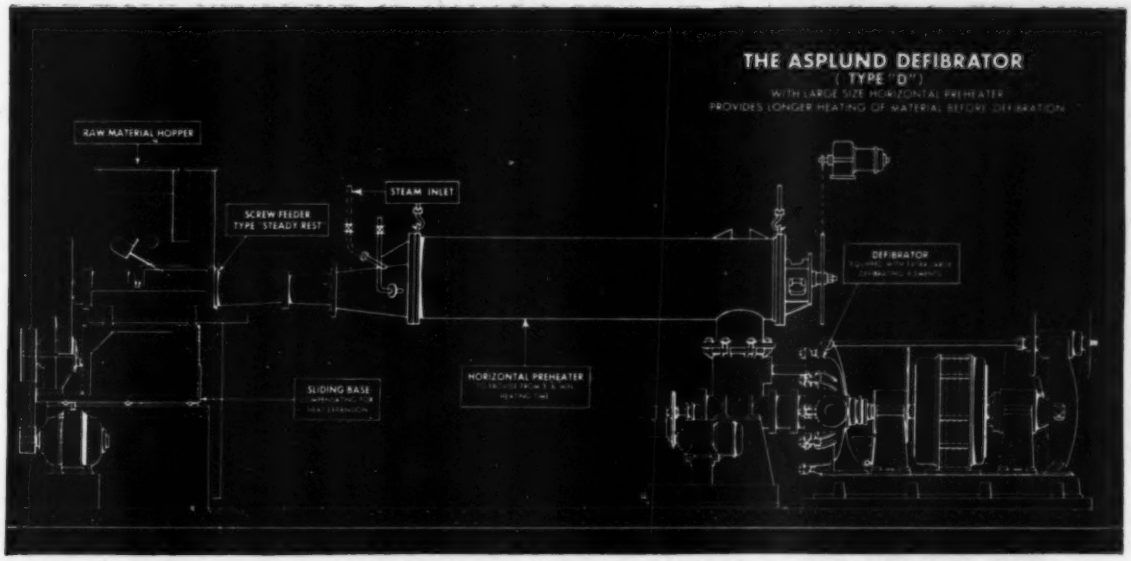
Tell us your requirements and we'll recommend an R-C Vacuum Pump with the proved ability to meet your needs. Ask us for Bulletin 50-B-13.

Roots-Connersville Blower Corporation
510 Monroe Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE

BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES



The Defibrator produces superior pulp for wallboard, hardboard, insulating board, corrugating board, and roofing felt from all kinds of chipped wood or other fibrous ligno-cellulose materials such as bagasse or straw.

The process can be controlled to produce or duplicate any desired degree of freeness or fineness of fibre. Pulp is homogeneous with all fibres intact, but well separated. Yield is high and power costs are low.

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Paper Mill Engineers!

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Designed to control the flow of heavy solutions of paper stock with a minimum of maintenance. Made from all types of stainless steel, monel or any combination. Contact nearest agent.

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Photoelectric REFLECTION METER

for accurate measurement of

Brightness and Opacity

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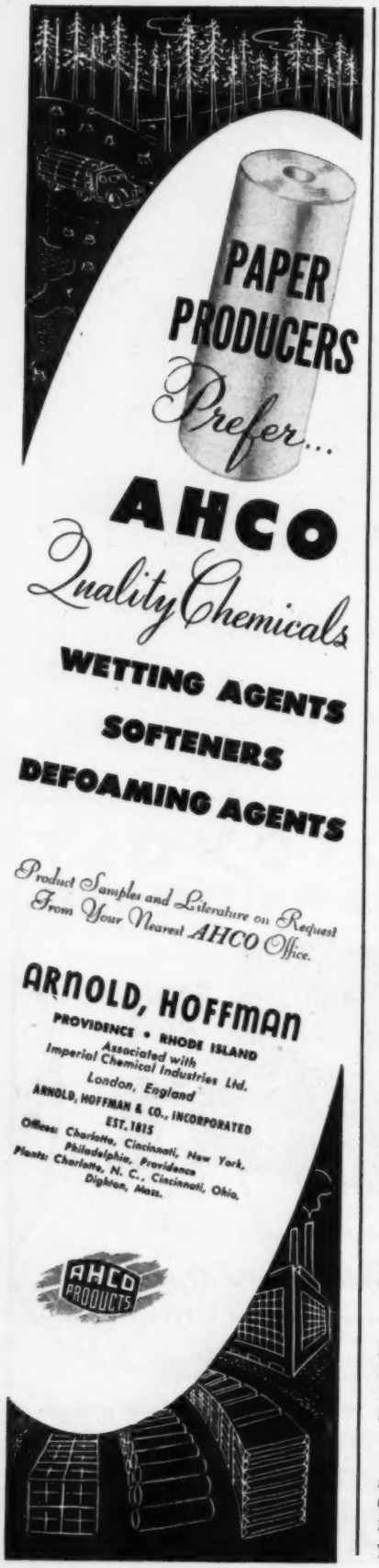

The Paper Industry Necrology

Joseph H. Miller

Long active in the paper industry, *Joseph H. Miller,* 57, retired vice president and general manager of Whiting-Plover Paper Co., Stevens Point, Wis., died September 12 after a long illness.

Mr. Miller joined the Stevens Point firm in 1910 as a stenographer. He rose through the ranks and was at one time purchasing agent and production manager. He retired because of ill health July 1, 1948. Mr. Miller was a charter member of the Cost Association of the Pulp and Paper Industry and a member of TAPPI. At the time of his death he was vice president of Sylvester & Nielsen Co., Appleton, and a director of the Citizens National Bank in Stevens Point.

Willett F. Ramsdell

Widely known in forestry work for a number of years, *Prof. Willett F. Ramsdell,* 60, of the University of Michigan School of Natural Resources died September 30 in Ann Arbor. Besides teaching forest land management, Professor Ramsdell was in charge of the Chase S. Osborn Forest Preserve in Michigan's upper peninsula. He joined the university faculty in 1930.

Irving McHenry, president and founder of Mid-States Gummed Paper Co., Chicago, died at his River Forest, Ill., home October 3. He was 66. Mr. McHenry founded the firm in 1916 and sold it to Minnesota Mining & Manufacturing Co. in 1945, but continued as president. The widow and one son survive.

Thomas W. Harrington, for 15 years sales manager of Crocker-McElwain Co., Holyoke, Mass., died September 15. He had been associated with the paper concern 42 years at the time of his retirement in 1947.

A. George Jacques, retired general manager of St. Lawrence Paper Mills Corp. Ltd., died October 11. He was 56.

Paul Richardson, vice president of Richardson Co., Lockland, Ohio, died September 29 in Evanston, Ill., where he had resided for 10 years. Survivors include the widow and two daughters.

Lloyd T. Riches, 62, vice president and general manager of Western Paper Converting Co., died in Salem, Ore., September 19 after an illness of two years.

Edward J. Burke, vice president of I. V. Sutphin Co., Cincinnati, died August 26 at the age of 49. The widow, a son, and a daughter survive.

Everet J. Hall, 75, retired general foreman for Embroy Box Co., Louisville, Ky., died at his home August 23.

Frank J. Schleicher, founder and president of F. J. Schleicher Paper Box Co., St. Louis, died in Lutheran Hospital August 24 at the age of 92. One of the early manufacturers of paper boxes in the Middle West, he had been active in the firm, which was founded in 1904, until recent years. Surviving are the widow and four sons.

Charles L. Asam, founder of Asam Wallpapers, Inc., of Philadelphia and Reading, died in Reading September 3. He was 80.

A. Cooper MacFarlane, 76, vice president of Carter Paper Co., died in Springfield, Mass., September 4 after a brief illness. He had been with the Carter firm since 1899.

James P. North, president of Green Bay Foundry & Machine Works, Green Bay, Wis., died September 7.

S. Austin Bicking, 58, retired director and treasurer of Bicking Paper Mfg. Co., Downington, Pa., died September 15 in Philadelphia.

O. Cromwell Jones, 75, vice president of Seaman Paper Co., Chicago, died September 16. He had been with the firm more than 25 years.

Paul C. Denny, 56, co-founder and president of Indianapolis Paper Container Corp., Indianapolis, died at his home October 11. He founded the firm in 1925 with Carl B. Shafer. Mr. Denny was a board member of the Peoples State Bank and a founder of the Indianapolis Naval Reserve.

Everett F. Howarth, for many years assistant manager of Crocker, Burbank & Co., Fitchburgh, Mass., died September 25. He had been with the firm 20 years.

Percy Hall Jennings, 69, of Cold Spring Harbor, L.I., N.Y., a director of International Paper Co., died October 2 following a long illness.

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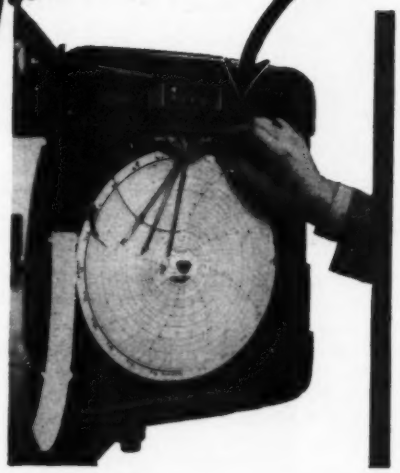

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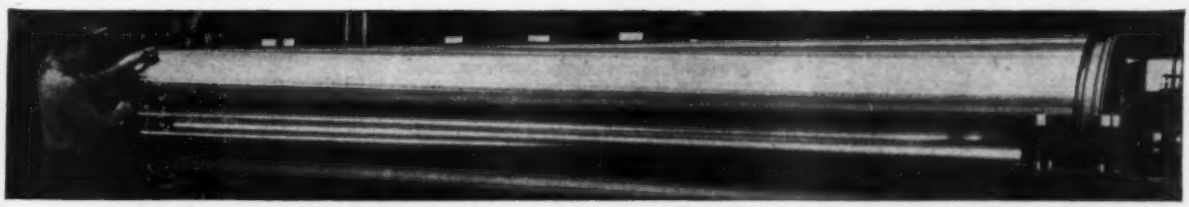

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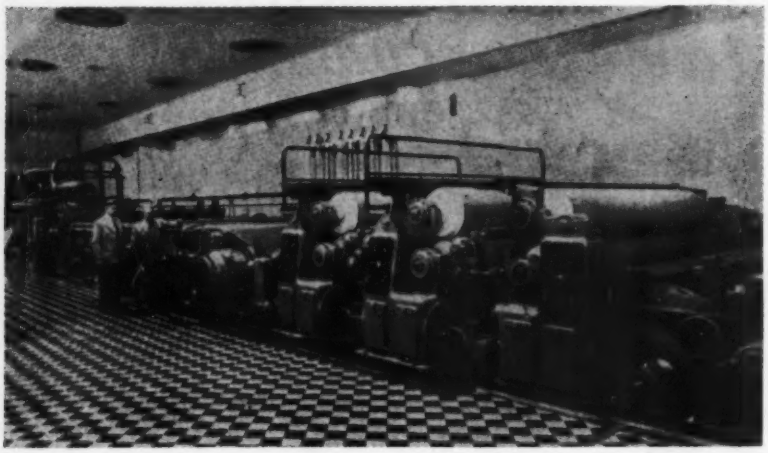


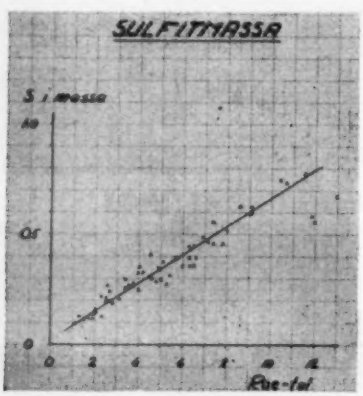
The Oldest Finnish Paper Mill: Its New Machines.

The Tervakoski paper mill, property of a company founded in 1818, is the oldest in Finland that is still in steady production. It specializes in high quality thin papers. During recent years the mill has been streamlined, and many sections have been rebuilt. A new 220 cm. paper machine built by A. Ahlström Osakeyhtiö, Karhula Works, began its operation three years ago, whereas a new paper machine (shown in the figure) started producing in May 1951. The machine makes condenser tissues, cigarette and carbon papers, and various specialties of high quality (ranging in weight from 7 to 40 grams per square meter). The trimmed width of this machine is 300 cm. (probably the broadest of this type in the world). Its wire length is 22 meters and its speed 20-120 meters per minute. It has three flat presses (including a smoothing press). There are 11 paper drying cylinders and five felt dryers. The calender stack and rewinders and slitters are of the most modern design. Its operation has been highly satisfactory.

The company (in contrast) has reconstructed *two* of its *old* machines, converting them into *one* paper machine which has also been operating since last May. Various parts of *this* machine came from the mill's oldest equipment (which began operation in 1851). The old machines prior to their reconstruction were actually in operation until the summer of 1950. Anon. *Paper and Timber,* 33, 253 (1951) (In English).

Recycling Waste Liquor in the Sulphite Cook

Recycling of large amounts of sulphite waste liquor in a subsequent digestion is possible without the danger of burnt cooks or inferior pulp provided the maximum temperature does not exceed 115C. A sulphite waste liquor can then be obtained which contains about 20 per cent total solids and about 55 grams of sugar per liter. This leads to a definite improvement in waste liquor evaporation, and in alcohol production. The method (of recycling) can yield bleached or unbleached strong pulps or pulps for grease-proof paper. In the present work, the sulphur consumption and pulp brightness were investigated and compared with those obtained with normal cooks (in which recycled liquor was *not* used). Results indicated that on recycling with 40 per cent waste liquor, the sulphur consumption was 10 per cent higher than normal and the brightness of unbleached pulp was often about 4 per cent G.E. lower than that of normal pulps. In some cases, however, the pulps were identical in brightness. The authors also studied the relationship between Roe chlorine number of the pulp and its content of sulphur, ash, and lime. The linear relationship between Roe number (Roe-tal) and sulphur in pulp (S i massa) is shown in the figure. Somewhat similar correlations were noted between Roe number and total ash, and lime in the pulp. Lennart Stockman and Erik Hägglund. *Svensk Papperstid,* 54, 243-247 (1951) (In Swedish; with English and German summaries).



Alkaline Purification of Unbleached Sulphite Pulp

A hot alkaline process for refining sulphite pulp was studied. A series of 24 gram samples of chlorinated pulp were treated with caustic soda solutions (4, 5, and 6 per cent based on the weight of pulp) using 5 per cent pulp consistency. The temperatures were also varied (and included treatment at 80, 85, 90, 95, and 100 C., for two and four hour periods). The resultant "waste liquor" was subjected to potentiometric and conductometric titrations with normal solutions of hydrochloric acid and sodium hydroxide, and from these analytical data, the distribution of the original caustic soda was estimated, i.e., the alkali combined with weak acids in the liquor, the free alkali in the liquor, and the alkali retained in the treated fiber. The organic acids present showed respective dissociation constants of 10^{-4}, 10^{-8} and 10^{-10}. The amount of organic matter dissolved in the liquor was also estimated, and its ratio to combined sodium was calculated at about 4:5, which would give this material a mean equivalent weight of about 100. T. Shogenji and H. Okada. *J. Japan Tech. Assoc. Pulp and Paper Ind.,* 4, No. 6, 9-16 (Dec., 1950) and 5, No. 1, 87 (Feb., 1951) (Original in Japanese, with English abstract); through *Bull. I. P. C.,* 21, No. 9, 644-5.

A new process for pulp manufacture

Chlorine in aqueous solution gives rise to hydrochloric and hypochlorous acid and on attempted delignification of Asplund pulps, hydrochloric acid invariably causes widespread degradation and gives rise to low quality pulps. True "chlorine-water" does not exist. On the other hand the judicious addition of calcium carbonate to the so-called chlorine water can give rise to what is essentially an aqueous solution of hypochlorous acid (plus calcium chloride). By continuing to pass chlorine into such a solution, the aqueous mixture contains both hypochlorous acid and molecular chlorine. Such a solution *(I)* was used successfully in delignifying defibrated straw, poplar and pine, giving pulps of high quality (the physical properties of which are fully tabulated).

By giving the defibrated raw materials a mild alkaline pretreatment at atmospheric pressure and 80-100 C., followed successively by treatments with *(I)*, washing with water, aqueous alkali (to remove chlorolignins) washing, and a mild (peroxide) bleach, excellent, bright paper pulps could be obtained. The successive oxidizing treatments, however, may have to be repeated two to three times to insure complete delignification. L. Grand. *Bull. assoc. tech. de l'ind. papetiere,* 5, 201-206 (1951) (In French).

Tearing strength of paper

The tearing strength (*I*) of handsheets from six different types of pulp was determined by means of the AFNOR apparatus (*II*) and by use of the dynamometer (*III*). The large number of data, obtained with pulps from kraft, linters and ramie (*IV*), are given only in the case of *IV*. The pulp was not carded, cut into various lengths, beaten in a Bouchet refiner to varying de-

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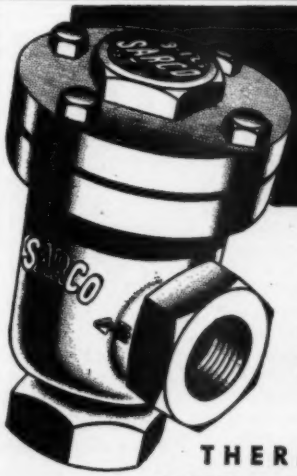

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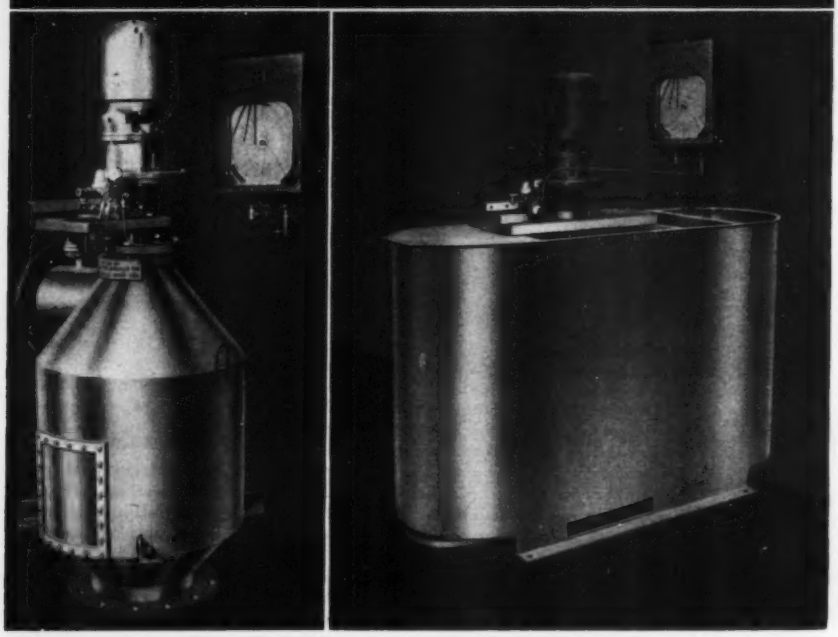

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grees Schopper-Riegler, classified in a Lorentzen apparatus, and converted into handsheets (formed under pressures of approximately 40, 60 and 100 g. per sq. m.).

Bursting strengths and breaking lengths of the various sheets from *IV* were also determined. The ratio (*V*) of *I* (determined with *II*) to *I* (determined with *III*) usually ranged from 0.8 to 0.9, but the minimum (*V*) was 0.68, and the maximum was 1.44. Marked irregularities in *I* were noted when this was calculated to the basis of a sheet-forming pressures of 100 g. per sq. m., thus assuming that *I* was actually proportional to the pressure under which the handsheet was made.

Apparently there was no correlation between *I* (calculated to 100 g. per sq. m.) and other variables (such as degree of beating). The ratio (*V*) also showed marked irregularities, and the entire *I* test presents difficulties which cannot be ascribed to any one factor. The author believes that an effective tear test should simulate as closely as possible tear "by hand"; that only a single, unconditioned sheet should be used, and that only initial tearing strength should be measured. Jean Francais. *Bull. assoc. tech. de l'ind. papetiere,* 5, 264-71 (1951) (In French).

Paper permanence

After discussing the principal chemical components of the cellulosic fiber, the author outlines the most satisfactory techniques in manufacture for insuring durability of paper. The fibers should be kept as nearly intact as possible, retaining "pure" alpha cellulose. Refining should be kept at a minimum. Resins used should have a positive polarity, using only volatile organic acids, to obtain the required acidity in emulsions. In the storage of paper (i.e. in archives) light (especially ultraviolet light) and heat are to be avoided, and a relative humidity of about 55-60 per cent is recommended. In no case should the humidity drop below 40 per cent. The deleterious effects of smoke, dust, rodent and insect attack are mentioned. K. E. C. Buyn. *Bull. assoc. tech. de l'ind. papetiere,* 5, 231-38 (1951) (In French).

Hypochlorite Bleaching of Sulphite Pulp with Calcium Bromide Addition

These experiments were made both in the laboratory and in mill runs at W. Rosenlew & Co. Ab's mill in Björneborg, Finland. Calcium bromide was added at the hypochlorite bleaching stage. The following *advantages* were noted: a somewhat stronger pulp, with a somewhat higher alpha cellulose content and with a lower copper number. Heat was saved, and the total bleaching time was shortened. However, there were the following *disadvantages*: the pitch content was increased somewhat as was the ash content of the pulps, which thus showed in decrease in quality. Furthermore the whiteness was somewhat limited. Göran Nordland. *Paper and Timber* (Finland), 33, 249-50 (1951) (Original in Swedish, with English summary).

Application of Melamine Resins in Manufacturing Wet-Strength Papers

The author discusses the application of the melamine resin "Mandurit M4" (*I*), its analysis, solution, aging, and wet-strengthening action and cure as well as the analysis of the finished sheet. *I* was added to bleached (usually) unbeaten, spruce sulphite pulps (*II*). In its application the amount of HCl added and the aging periods are of vital importance; the latter should never be less than 8-10 hours (but may be extended to 3-4 days). HCl dosage must be carefully controlled, because the most effective quantity is that at which the (*I*) solution is *just* stabilized. Smaller amounts lead to unstable *I* solutions, whereas an excess of HCl causes a lowered wet strength. Long standing of *I* in solution at about 95F, either before or after addition of *I*, decreased its effectiveness. The recommended practice was to cool the *I* solution rapidly to 70F, add the required HCl, and then cool to room temperature prior to the aging process. The optimum (economic) amount of *I* is discussed, and was 2-3 per cent per dry weight *II* (although this would vary with different pulp and stock preparations). Past this optimum, the effects of *I* were minimal. The full effect of *I* depends on an ample curing time at a suitably high temperature. Storage of treated paper at room temperature shows little effect on wet strength, excepting over comparatively long time periods. 14 References. Luitgard Görnhardt. *Das Papier,* 5, 209-12, 256-60 (1951) (In German).

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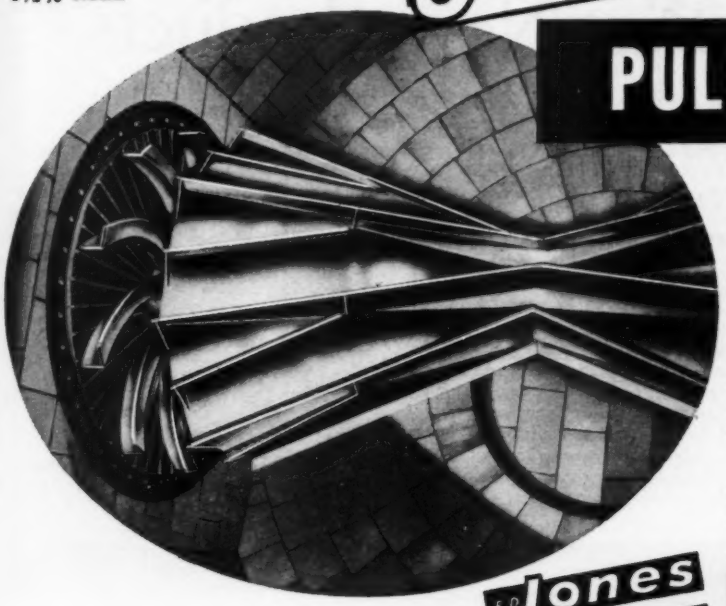

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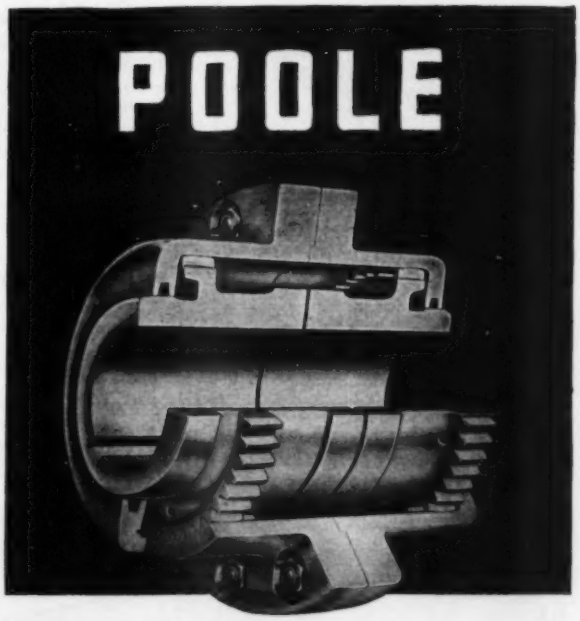

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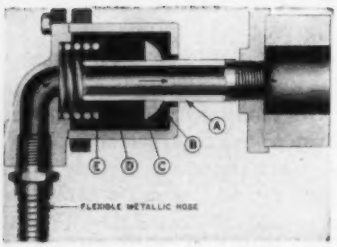

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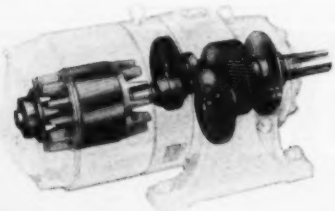

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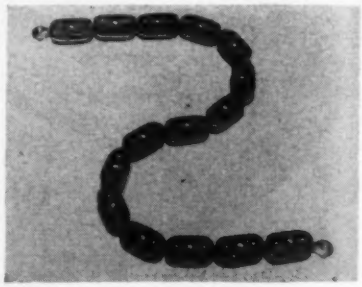

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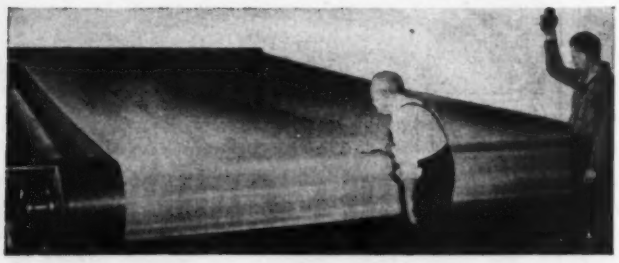

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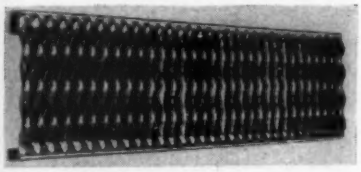
Here is a fourdrinier wire getting its final conditioning on the "stretching table". Only molten metal, *centrifugally cast*, weeks ago in our foundry, the many and varied skills in our large, completely integrated plant have transformed the alloys into a uniformly-woven wire that will enable some fine mill to maintain its reputation for top-quality paper.

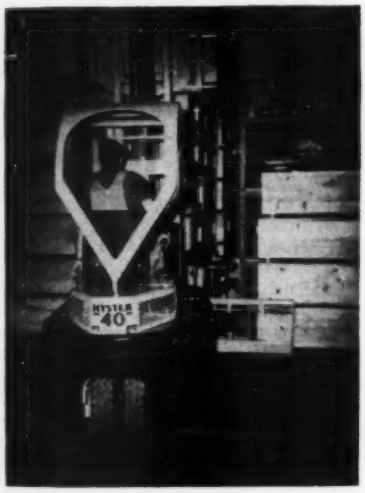
EASTWOOD - NEALLEY CORPORATION • Belleville, N. J.

boilers with capacities up to 20,000,000 Btu. per hour are especially designed for high circulation temperatures and for high flow velocity to avoid overheating the liquid transfer medium. Special centrifugal pumps are rated up to 1600 gpm. Package units, mounted on a common frame, utilize electric heaters with capacities from 3 to 75 kw., or gas heaters with ratings of 250,000 to 1,000,000 Btu. per hour, and may be adapted for oil firing. Circulating pumps for these units come in sizes of 1½ to 120 gpm. *American Hydrotherm Corp., 33-70 Twelfth St., Long Island City 6, N.Y.*



Non-skid Walkways

Development of Grip-Strut grating for use wherever a non-skid surface is required. Consists of an anti-skid surface on the edges of a series of formed struts. Has strength and light weight, with special application on work platforms, steps, cat walks, and other runs where anti-skid features are resirable. Easily cleaned. *The Globe Co., 4000 S. Princeton Ave., Chicago, Ill.*

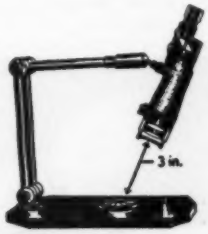


Easy-steering lift truck

All YT-40 lift trucks with 4,000 lb. capacity are now manufactured with dual wheels on the steering trunnion, making steering easy and effortless by reducing the gear ratio in the steering mechanism for less turn of the steering wheel. Tire service and maintenance are easily handled by removal of one accessible lock stud. Present single-wheel type model 40's can be converted if desired. *Hyster Co., 2902 N.E. Clackamas St., Portland 8, Oregon.*

Acid-proof joint

A wrapped joint for Haveg and other resin-base pipe, known as the Duro-Joint, replaces in many instances the flange type of joint which is subject to corrosion. It is composed of a spiral wrapping of glass cloth and Lecite acid and alkali-proof furan resin cement using a special technique. Can be used to repair broken pipe or to armor porcelain or stoneware. *Electro Chemical Engr. & Mfg. Co., 750 Broad St., Emmaus, Pa.*



Miscroscope

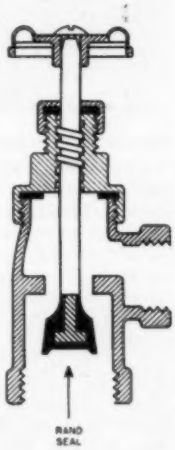
Examinations from any angle can be easily accomplished with the 35 power erecting Edmund microscope. The "all-position" universal mount permits it to swing freely in any direction. Prism erectors give viewer an erect image, not upside down as in an ordinary microscope, and the 3-element color corrected objective is 1 in. dia. The microscope body is brass with black crackle finish. Instrument is 6½ in. long—base 7 in. x 9. in. *Edmund Scientific Corp., Dept. 85, Barrington, N. J.*

Centrifugal pumps

The Rex self-priming centrifugal pumps have been introduced in sizes from 1½ in. model 4M pumps up to 6 in. model 90M pumps. Capacities range from 4,000 gal. per hr. up to 90,000. Longer seal life and reliable pump operation are obtained by never subjecting the impeller shaft seal to pumping pressure. Easy and inexpensive replacement of wearing parts. *Chain Belt Co., 1600 West Bruce St., Milwaukee 4, Wis.*

Leaf-proof seal

The concept of working with, rather than against, the fluid flow has been applied to valve design in the development of the Rand Seal for the purpose of producing a leak-proof valve. This cone-shaped seal is closed in the same direction as the movement of the liquid, allowing high or low pressures to seal the valve. Leak-inducing permanent deformation found in previous designs based on the compression of a resilient member against a non-resilient seat is thereby eliminated. The Rand Seal is adaptable to many present designs of valves and other devices for the control of fluid and gas flow. Rodic Chemical and Rubber Corp., Allen Ave., New Brunswick, N.J.



Universal Dynamic Balancer

The Universal Dynamic Balancer is a machine which provides a simple method of putting armatures, rotors, pulleys, flywheels, gears, hubs, drums, etc. in true dynamic bal-

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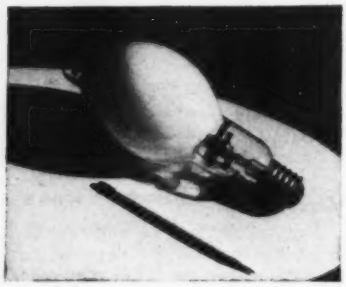
Louisville 2, Kentucky

ance. The part to be balanced is placed on the balancer with shafts resting on ball-bearing rollers and then rotated to determine the position of dynamic unbalance so that corrective weights can be added. While rotating, the shafts are marked with pencil or crayon. Because unbalance causes the shaft to rotate off center, the markings will appear on one side thus showing where weights should be added. The balancer is six feet in height, requires 54 in. by 96 in. of floor space and weighs approximately 1600 lb. It will balance equipment up to 48 in. dia., 4000 lb., and 80 in. between the vertical standards. *Industrial Engineering Equip. Co., 122 E. Fourth St., Davenport, Iowa.*



Fluorescent lamp

A basically new light source, the 400-watt J-H1 fluorescent mercury-vapor lamp, is designed to provide a whiter light. The bulb has an inside coat of a phosphor that fluoresces red when activated by invisible ultraviolet light generated by the quartz arc. This balances the spectrum to provide a light that is white enough for most industrial purposes at lower mounting heights. Usable in existing fixtures. *Westinghouse Electric Corp., Lamp Division, Bloomfield, N. J.*

Electric vibrator

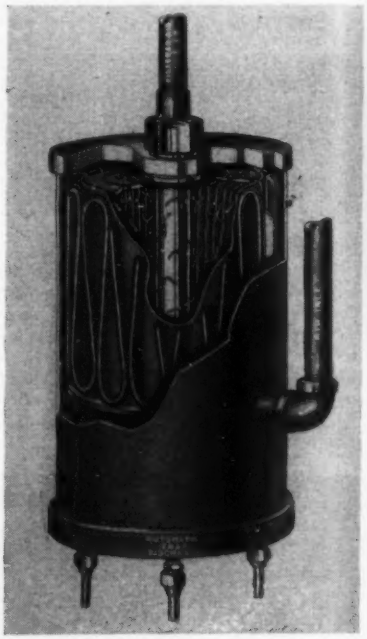
Labor saving and minimum flow time are two features of the Er Topdog light-weight electric vibrator, which is effective on concrete and wood, as well as steel bins and silos. Use of this vibrator eliminates need for steam jets, compressed air and pounding devices for accelerating the flow of materials, and the device speeds feeding to a point where flow time in a digester is halved. It is available in voltages up to 550 volts and for use with 40-60 cycle, 3-phase current. Weighs only 50 lb., but attains maximum impact of 700 lbs. *Vibro-Plus Products, Inc., 54-11 Queens Blvd., Woodside, New York.*

Tube cleaner

A powerful-actioned straight tube cleaner for process heat exchangers has been developed for removing deposits from completely plugged tubes. Hollow shafting is available for this mode TP-301 up to 20 ft. or in sectional threaded lengths. This positive air driven, rotary shaft, drill type tool scavenges the tube with air or water while cleaning and operates on air pressure as low as 50 lb. *Thomas C. Wilson, Inc., 21-11 44th Ave., Long Island City 1, N.Y.*

Carbon Equipment

Equipment such as coolers, heat exchangers, evaporators, boilers, tank linings and tiles, fume ducts, etc. are now being manufactured from a carbon and graphite material that is strong and corrosion-resistant, with good properties of refractoriness and controllable thermal conductivity. Pumps and ejectors made from this material are now being developed. *Parlam Corp., 336 Canal St., New York 13. N.Y.*



Air Purifier

By combining in a single unit a dehydrating device, a mechanical filter and a self-purging trap to make up a device called the "Condensifilter," it is possible to remove water, oil, sludge and other foreign materials from compressed air and provide dry, clean air for operating instruments. Measuring only 15 in. high by 9 in. in diameter, it has a capacity of 30 cfm at 100 psi. When requirements are greater than the rated capacity of a single unit, Condensifilters may be installed in parallel. *Hankison Corp., 345 Renton Building, 1501 Beaver Ave., Pittsburgh, Pa.*

Paraffin interceptor

The Josam intercepting device is designed to intercept and remove paraffin and other waxes that tend to congeal on the sides of the waste pipe lines eventually leading to clogging and expensive repairs. Approximately 96 percent of the paraffin can be intercepted and removed for sale or re-use. Interceptors are furnished in cast iron or steel. *Josam Mfg. Co., Dept. PT, Josam Bldg., Cleveland 13, Ohio.*

Alkaline tank cleaner

It is no longer necessary to use chisels, hammers, etc., to remove stubborn residues and coatings left in dried out tanks which are necessary to mix sizes, coatings and paints for process applications. A "boiling out" process does the job with fewer man hours and the cleaning is complete without

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Machinery for Ground Wood and Chemical Pulp Mills

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exposing the employees to injuries and fumes. The method involves treating the tank with a solution of Magnus 61XX, heating it 200 to 212 F., and agitating overnight. After ten hours, this alkaline stripping agent is drained and the tank is flushed out with cold water for about fifteen minutes. The tank should be available 24 hrs. after the cleaning starts. Where the coating is very thick, it is sometimes necessary to use a second overnight treatment. *Magnus Chemical Co., Inc., South Ave., Garwood, N.J.*

Trackage system

The latest developments of the Epco Trackage system, a medium used for transporting heavy goods of any kind inside the plant, include installations over a drawbridge that connects two loading platforms, and in a floor scale so that paper rolls can be moved right onto the scale and weighed before going to roll stand or storeroom. This transportation system, which becomes a part of the floor, is not damaged by foot or truck traffic crossing it and can be adapted to any weight loads. Turntables are used to change loads in any direction. *Engineering Products Co., Inc., 122 South Michigan Ave., Chicago 3, Ill.*

Adhesive machinery oil

Reducing the number of oilings required, often as much as five times, is one of the features of the general purpose machinery Kling oil. This is made possible by a metal adhesiveness quality that makes the oil stay longer than conventional oils. Kling-oil also promotes safer and cleaner shop, since there is less dripping and spattering. The tackiness property is unaffected by the rubbing action of machinery. It has an SAE-30 viscosity and may be used anywhere that such oils are used and applied by the same methods. *Magnus Chemical Co., Inc., Dept. PI-109, Garwood, N.J.*

Countershaft drive

The Speed Selector countershaft drive is designed for installations where driven shaft speeds must be lower than motor shaft speeds. This unit utilizes 7 in. and 8 in. combination sheaves and is available for drives from 2 to 15 hp. It is designed so that the complete assembly with combination sheaves may be used, or parts of the assembly may be combined into other types of drives. Remote control devices are easily adapted to it. Neither multi-groove sheave nor the motor is furnished by the manufacturer. *Speed Selector, Inc., 118 Noble Court, Cleveland 13, Ohio.*

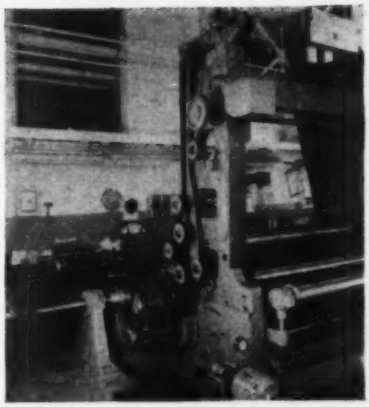
Redesigned gas truck

Easier accessibility to the engine compartment, a new type parking brake, an instrument panel mounted on the steering column, easier steering and redesign for faster maintenance are features of the improved Clark Gas Clipper.

The "No-Kick-Back" steering is achieved by the use of an Elliot-type axle with the tie rods in the same plane and more nearly in line with the forces they transmit, plus relocation of steering knuckles as close to the tire's dead-center shock point as is practical. Better riding is achieved through the use of cushion tires on all models and rubber torsional bushings at pivot mounting points. Redesigned double cylinder tilt system gives better upright stability with a smoother, more positive control of tilt. *Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.*

Humidity indicator

The Airguide direct-reading hygrometer, as easily read as a clock, has been adapted for general industrial use. The manufacturer claims that it is the simplest means yet devised for keeping constant and accurate check on the relative humidity. Merely by reading the indicating hand, relative humidity from 0 to 100 per cent can be obtained without calculating or thermometer readings. The indicator will operate in temperautres to 175 F. The wall-mounting case of this instrument has a diameter of 4⅝ in. *Fee and Stemwedel, Inc., 2210 W. Wabansia Ave., Chicago, Ill.*



V-Belt drive slitter and winder

V-belt drives are now used to equip the heavy-duty "DA" slitters and winders, providing high operating speeds of 3,000 feet per minute and over as well as smooth, flexible, quiet running. A variable pitch V-belt sheave is used for the rear winding drum so that the relative speeds between the two winding drums can be adjusted to suit grades of paper or board and roll density or hardness required. In addition, the winding drums are equipped with hydraulic brakes so that the machine can be brought to a smooth and rapid halt at the end of each roll. Heavy cast iron bedplates and frames are still retained. Roll ejectors and roll drops are optional. *Samuel M. Langston Co., Camden, N.J.*

New Products Briefs . . .

WOOD PRESERVER—Protection against dry rot for wood to be exposed to immersion in water is the purpose of Fungus-Ban, a copper napthanate dip. After preservative treatment and 24 hrs. drying, the wood can be painted over with ship bottom paint or normal paint. *Wilbur & Williams Co., Boston 35, Mass.*

SPARK-ENCLOSED TRUCK — Provides safety operations in gas and dust laden areas by shielding the electrical equipment against spark. Water-type exhaust manifold, water-cooled muffler, and static conductive tires do the job. *Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Penna.*

DELIVERY PUMP—Suitable for heavy-duty pushing, pulling, lifting and lowering applications, as well as for maintaining high static loads on large clamping rams. Operates up to 1800 rpm for pressures up to 3000 and 5000 psi. *The Oilgear Co., 1560 West Pierce St., Milwaukee 4, Wis.*

RESIN CEMENT—Resistant to many acids, solvents, greases and oxidizing agents, this synthetic cement has hard adhesion properties with concrete and metals and for the joining of brick, tile and other materials. *Atlas Mineral Products Co., Mertztown, Penna.*

SIZE MATERIALS—Paper Makers Chemical Dept. has renamed its former Dresinate 209 fortified rosin size "Pexol" and its former Dresinate 211 size additive in dry form "Size-Aid." Both products now available. *Hercules Powder Co., Wilmington, Del.*

HIGH-LIFT ELECTRIC TRUCK—The "Hi-Lift" truck has four basic characteristics: The walking operator; electric lift and travel; and convenient finger tip control of all movements. Different lines available. *Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.*

POURING SPOUT—The GS safety air vent pouring spout fits any size carboy and assures a smooth even flow of acid without spurts or splashes. The unit is made of a special acid-resistant rubber and plastic tubing for longer life; the spout has a capacity of 5 gal. per min. *General Scientific Equip. Co., 27th & Huntingdon Sts., Philadelphia 32, Pa.*

MOTOR-DRIVEN TROLLEY — A hydraulic coupling which transmits power from the motor to the drive through a cushion of oil qualifies this trolley for functional advantages such as increased load and operator safety, lower hoist maintenance costs, and eliminates trolley brakes and complex electrical speed changing equipment. *Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa.*

INDUSTRIAL FLOOR MATERIAL—The addition of pulverized natural rubber to "Immediate-Set" flooring material consisting of asphalt-rock limestone and cold asphalt emulsion greatly increases life span of the floor, reduces brittleness in sub-freezing weather, and lessens the tendency to rut or wave even under extremely heavy point loads. *Flash Stone Co., Inc., 30 E. Rittenhouse St., Philadelphia 44, Pa.*

The Paper Industry New Literature

Books

FORESTRY IN FARM MANAGEMENT. By R. H. Westveld and the late Ralph H. Peck, second edition revised by R. H. Westveld. Published by John Wiley & Sons, Inc., New York, N. Y. 340 pages. 9¼ x 6. $5.00.

This volume combines basic principles with new forest techniques and equipment, which have made farm forestry work easier and faster. The author is professor and chairman of the department of forestry, University of Missouri. For more than three years he was with the Pacific Northwest Forest Experiment Station at Portland, Ore., where he worked exclusively on research dealing with slash disposal and regeneration problems of Ponderosa pine.

New phases of farm forestry included in the second edition are power saws and tree planting machines; new preservatives and methods for using them; new shearing techniques; important data on protection from fire, grazing, insects, wild animals and climatic extremes; form-class tables, and techniques and methods for measuring growth. There is a chapter on federal, state, and private aid programs, as well as an appendix and an index.

PULP AND PAPER MANUFACTURE BIBLIOGRAPHY, 1946-1950. Compiled by Clarence J. West. Published under the direction of the Technical Association of the Pulp and Paper Industry, 122 E. 42d St., New York, N. Y., by Badger Printing Co., Appleton, Wis. 752 pages. 9 x 6.

The author, chairman of the committee on bibliography of TAPPI, chairman of the TAPPI editorial board, and research associate and editor for the Institute of Paper Chemistry, has compiled a bibliographical index of the literature of the industry for the years 1946-1950. The volume is confined to books and periodical articles on almost all phases of the industry from highly technical subjects to pieces on management, employees, and safety. There is an author index as well as a subject index.

THE DICTIONARY OF PAPER. Published under the auspices and direction of the American Paper and Pulp Association, New York, N. Y., by George Banta Publishing Co., Menasha, Wis. 393 pages. 9⅜ x 6¼. $6.50.

This second edition has been prepared by a specially appointed industry committee working with the Institute of Paper Chemistry, Appleton, Wis. Definitions of hundreds of terms encountered in all phases of the industry are presented in an easy-to-read manner. Included are sections on philosophy of definitions; classifications and definitions of pulps; classification of waste materials used in the paper and board industries; definitions of papers, boards, and papermaking terms, and a bibliography.

BARRELL'S PAPER ANNUAL, Vol. 10. Published by William L. Barrell Co., Lawrence, Mass. 95 pages. 9¼ x 6¼. Limited to 1,000 copies.

"Keeping Pace with Papermaking," the lead article in this annual publication, traces the method of drying paper from the original loft-drying to the present continuous system. The revised edition of Paper Trade Terms by William Bond Wheelwright occupies 48 pages, including 10 full-page photographs illustrating the most essential papermaking equipment. There is a section presenting a directory of officials of 33 industry associations. Included also is an index to the Barrell Annual for the years 1942-1952.

SOURCE OF SUPPLY DIRECTORY—1951 Edition. Published by Howard Publishing Co., 111 W. Washington St., Chicago 2. 828 pages. Paperbound. 6½ x 4⅜. $4.00.

This annual publication is a directory to paper and allied lines for the use of paper merchants and converters. Included are sections on sources of supply; converting machinery, equipment and supplies; listings of paper merchants; manufacturers' representatives, and exporters and importers. The sources of supply are listed according to the type of paper or paper product, while the converting section is listed according to equipment desired. There is an advertisers' index.

Booklets and Pamphlets

THE STORY OF PULP AND PAPER. Published by American Forest Products Industries, Inc., 1319 18th St. N.W., Washington 6, D.C. 16 pages. 8½ x 3¾. Explanation of the development of papermaking is presented in a non-technical manner. Featured are a special "flow chart," which shows the papermaking process from woods to finished rolls, and a map that shows the locations of the country's principal forest areas.

BOOKLETS ON MANAGEMENT AND FOREMANSHIP. Published by National Foremen's Institute, Inc., 100 Garfield Ave., New London, Conn. $3.00 each. These three manuals comprise volumes seven, eight, and nine of the Standard Management Practice Series. The titles are as follows: "Methods Improvement and the Foreman," "Human Relations and the Foreman," and "Safety and the Foreman."

TESTING OF MEASURING EQUIPMENT, A MANUAL FOR WEIGHTS AND MEASURES OFFICIALS. By Ralph W. Smith. Published by the National Bureau of Standards, U. S. Department of Commerce, Washington 25, D. C. (NBS Handbook 45, vii). 205 pages. $1.25. This publication deals with commercial measures and measuring devices. Included are recommendations for the testing apparatus required for various purposes, instructions, testing procedures, codes of specifications, tolerances, etc.

PROCEEDINGS OF THE 1951 ANNUAL MEETING OF THE RESEARCH AND DEVELOPMENT ASSOCIATES, FOOD AND CONTAINER INSTITUTE. Published by R&DA, Food and Container Institute, 1849 W. Pershing Rd., Chicago 9. 100 pages. 9 x 6. Military, industrial, and scientific leaders tell how military subsistence and packaging have been improved since World War II. Included also are lists of 1951-52 officers, members of the executive committee, and board of directors.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.

Pyrometers. Bristol Co., Waterbury 20, Conn.—Bulletin P1244 describes the firm's complete line of millivoltmeter type indicating pyrometers and pyrometer controllers for temperatures up to 4000F. Indicating pyrometers for wall, switchboard, and flush-panel mounting, and for portable use are illustrated, as are rotary and toggle switches for use with these pyrometers where a number of temperatures are to be measured with one instrument.

pH Measurement and Control. Bristol Co., Waterbury 20, Conn.—This 24-page bulletin (pH1302) describes Bristol's line of recording and controlling instruments for pH. Complete specifications are given on glass and calomel electrodes in several different models for both immersion and flow uses. Also included are illustrations and descriptions of a number of applications for water treatment, industrial waste disposal.

Electronic Tubes. Milo Radio & Electronics Corp., 200 Greenwich St., New York 7, N. Y.—Designed for industrial use, this 28-page booklet furnishes complete technical specifications and information on hundreds of special purpose electronic tubes used in various industrial applications, i. e., control, processing, production, research, testing, counting, sorting, measuring, weighing, detecting, etc.

Flow Ratio Control. Fischer & Porter Co., Hatboro, Pa.—Catalogue 53 (8 pages) features the firm's line of automatic flow ratio control systems. The principle of operation is described, as well as the fundamental reasons for improved ratio control. A list of applications is included.

Alloy Steel Tubing. Babcock & Wilcox Tube Co., Beaver Falls, Pa.—This 4-page bulletin (TDC 141) includes advice on problems in-

the *New* Gilbert & Nash 434 UG Wire & Felt Guide

This newest guide of the 50 year old Gilbert and Nash line features Low Head design and enclosed reduction gear. Speed to 2000 1/min. Engineered throughout to traditional Gilbert and Nash standards. Write for complete specifications.

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volving the use of alternate grades of medium carbon, or full hardening, grades of tubing steels. Contained in the publication are condensed data on microstructure, critical points, effect of alloy elements, forging, machining, welding, and thermal treatment for 14 well-known steel alloys used in the production of tubular parts.

Steam Purifiers. V. D. Anderson Co., 1935 W. 96th St., Cleveland 2, Ohio—Bulletin 100 is a 4-page folder describing an internal type purifier designed to remove virtually 100 per cent entrainment from vapor. The purifier, known as Anderson Hi-eF, is recommended for installations inside steam drums, flash tanks, evaporators, packed towers, bubble-cap towers, deodorizers, and stills. The bulletin also includes a cut-away drawing illustrating flow of vapor through the unit, a table of dimensions, specifications, and a description of operation.

Pumps. Warren Steam Pump Co., Inc., Warren, Mass.—Warren's Type "G" pump for process and chemical plants having semi-critical requirements is described and illustrated in 4-page bulletin WQ-213. The pump is available in 1 to 3 inch discharge sizes and heads to 240 feet. Included are specifications, dimensions, and a selection chart.

Laboratory Microscopes. Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.—Dynoptic Labroscopes for laboratory work are fully described and illustrated in a 24-page catalogue (D-185). Featured in the new line are ball bearings and rollers throughout the focusing system, a low position fine adjustment, and a mechanical stage with low controls.

Revolver Cranes. American Hoist and Derrick Co., St. Paul 1, Minn.—Catalogue 400-R-3 (20 pages) features American revolver cranes in industrial use. The publication is illustrated with views of the huge units working at ports and industrial plants throughout the world, showing many specialized applications. Included are the lifting capacities of the five standard models.

Meters. Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.—This 12-page bulletin (No. OG400) explains the proper selection of meters for measuring more than 200 liquids with varying corrosive characteristics. Included are tables and a specification sheet.

Time Recorders. Bristol Co., Waterbury 20, Conn.—Information concerning the application of the recorders to presses, factory machinery, refrigerators, pumps and motors, conveyors, continuous ovens, and furnaces is given in bulletin OP1504. Included are photographs, reproductions of chart records, and operation drawings.

Roof Maintenance. Tremco Mfg. Co., 8701 Kinsman Rd., Cleveland, Ohio—This four-page bulletin describes economical, labor-saving techniques for the removal of gravel by machine, and the mechanical pumping of roofing materials from the ground to the roof.

Ventilators. Burt Mfg. Co., 927 S. High St., Akron 11, Ohio.—This catalogue covers the complete line of Burt ventilators and louvers and supplies design and construction features for each ventilator type, plus mounting and flashing details, performance, dimension and weight data.

Hydrogen Peroxide. Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa.—This 36-page booklet, "Hydrogen Peroxide," is prepared especially for workers requiring a compact, ready reference of a general nature. Written in non-technical language, the book gives suggestions for the application, use, handling, shipping, and storing of hydrogen peroxide.

Steel Strapping. Allegheny Steel Band Co., P. O. Box 716, Pittsburgh 30, Pa.—"Steelband" strapping, seals, tensioners, sealers and accessories are illustrated in this 6-page folder. Included are specification charts and illustrations of the various models.

Flooring. United Laboratories, Inc., Cleveland 12, Ohio.—This 8-page brochure contains information on how and where to apply Plastic Rock flooring, as well as certain technical data about the product itself. Bulletin 200 illustrates many typical flooring applications and the resurfacing of areas subject to heavy traffic both foot and wheel.

Glass Block. American Structural Products Co., Toledo 1, Ohio.—This 16-page booklet (IB88 50M-514) describes the use of glass block as a replacement for worn-out window sash. Illustrations of installations and data on architectural details are provided.

Purifiers. Centrifix Corp., 3608 Payne Ave., Cleveland 14, Ohio—This 4-page general bulletin (G-51) illustrates and describes the functions of nine types of purifiers for entrainment separation in air, steam, vapor, gas applications in power generation, petroleum refining, chemical and food processing fields. Special purpose purifiers and general applications are described.

Worm-Gear Drives. Cleveland Worm & Gear Co., 3293 E. 80th St., Cleveland 4, Ohio—Complete description and application data for worm-gear drives and speed reducers are included in this 8-page folder, "Finest in Worm-Gear Drives."

Ammeters. Multi-Amp Corp., 121 Cross St., Harrison, N. J.—Descriptive bulletin C-100-351 gives a detailed technical description of the firm's newest model. The device is used for testing and calibrating current actuated devices.

Resistance Welding. International Nickel Co., Inc., Development and Research Division, 67 Wall St., New York 5, N. Y.—Technical bulletin T-33 (32 pages) presents information on the resistance welding of nickel and high nickel alloys. Included are tables on mechanical properties, chemical compositions, recommended conditions for welding, and other information.

Copper Corrosion Resistance. American Brass Co., Waterbury 20, Conn.—Anaconda publication B-36 is a 26-page bulletin reporting laboratory research and field study on the nature of corrosive attack on copper and copper alloys. The chemical and physical nature of corrosive attack in its various forms are explained. Included is a tabulation indicating the relative corrosion resistance of the principal types of copper and copper base alloys when in contact with 183 different corroding agents.

Employee Retirement Plans. W. L. Morgan & Co., Distributors of Wellington Fund, 1420 Walnut St., Philadelphia 2, Pa.—A 17-page booklet, "The Use of Wellington Fund in Retirement Plans," describes pension plans based on deferred profit-sharing. The publication gives in detailed and simplified fashion the tax and other advantages of such plans for employers and employees, as well as the essential requirements and procedure for qualifying them with the Internal Revenue Department. Included is a typical plan and trust agreement.

Caustic Soda. Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa.—Problems on purchasing, handling and storage, equipment design, and technical data are discussed in a 24-page bulletin, "NaOH—Caustic Soda." The section on equipment design deals with problems of engineering, construction, and maintenance personnel. Charts and tables are directed principally at technicians and chemists. A separate leaflet covers instructions for the safe handling of caustic soda tank cars.

Pipe and Tubing. International Nickel Co., Inc., Development and Research Division, 67 Wall St., New York 5, N. Y.—Technical bulletin T-17 is a 27-page booklet on the fabrication and design of nickel and high nickel alloy pipe and tubing. Illustrated by drawings and photographs, the publication presents tables on mechanical and physical properties, A.S.M.E. code requirements, recommended welding procedures, and other information.

Mixers. Abbé Engineering Co., 50 Church St., New York 7, N. Y.—The construction and design, together with specification and performance data charts, of Abbé dispersal mixers are described and illustrated in catalogue 68 (12 pages). Other Abbé equipment is also shown.

Feeders and Conveyors. Jeffrey Mfg. Co., Columbus 16, Ohio—Catalogue 830 (84 pages) gives complete description of the firm's line, including principles of design and operation, specifications, dimension, applications, and technical charts and tables.

Cleaning Compounds. Magnuson Products Corp., 50 Court St., Brooklyn 2, N. Y.—Cleaning compounds for all paper mill cleaning operations are described in the 16-page booklet, "Permag Cleaning Compounds for Paper Mills." Almost every possible cleaning operation on the various mill equipment is given step by step, as well as suggestions on building maintenance.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946
(Title 39, United States Code, Section 233)

Of THE PAPER INDUSTRY published monthly at Mount Morris, Illinois for October 1, 1951.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Frita Publications, Inc., 431 S. Dearborn St., Chicago, Ill.; Editorial Director, Richard W. Porter, 431 S. Dearborn St., Chicago, Ill.; Business manager, A. Scott Dowd, 431 S. Dearborn St., Chicago, Ill.

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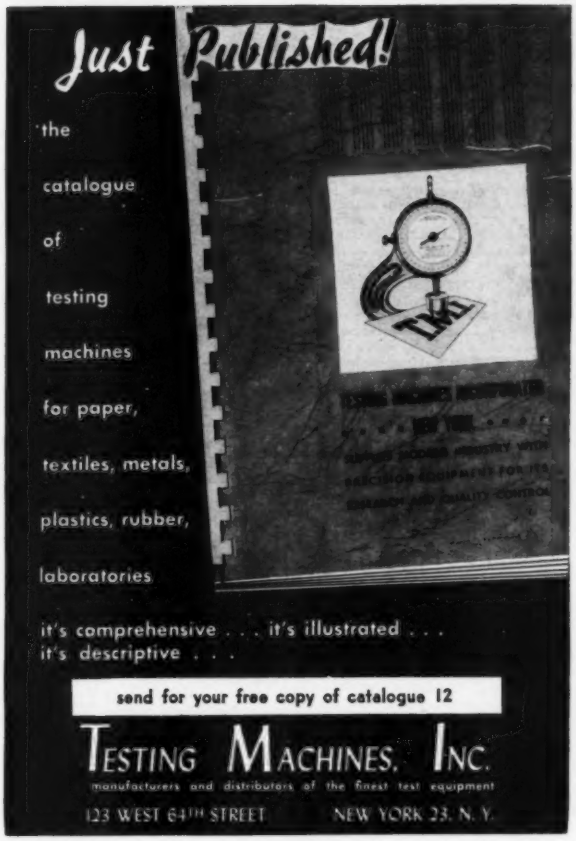
5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly and triweekly newspapers only.)

A. SCOTT DOWD, Business Manager.

Sworn to and subscribed before me this 1st day of October, 1951.
[SEAL]
EILEEN G. BENSON, Notary Public.
(My commission expires May 20, 1955.)



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Manufacturer's Representatives

Century-old firm seeks experienced representatives in Northwest, North Central and Eastern United States to sell new Roll Press already accepted as a more efficient method of reducing and dewatering bark, wood chips, screenings, etc. Applicants must be presently selling to pulp and paper industry with a successful record in related lines. There is a great untapped market for this money-saving equipment and a real opportunity for men who have the experience, contacts and perserverance to make the most of it. No others need apply. Address:

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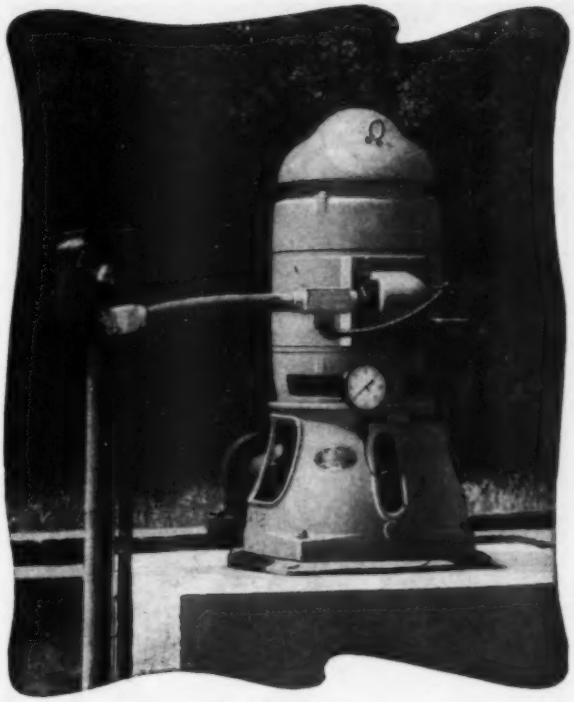

FOR THE CITY OF TOMS RIVER, New Jersey

With her population more than doubling during the summer season, the resort city of Toms River, New Jersey, was facing a serious water shortage. Five old, inefficient and not too dependable wells were being operated with suction pumps.

Layne was called in for a discussion of what could be done with limited funds. Layne's recommendations resulted in a contract for the rebuilding and re-equipping of one old well and the drilling and equipping of a new one. The contract also called for an auxiliary, gasoline engine drive on one of the pumps for use in case of electric power failure. Without delay everything was finished according to the contract, giving the city of Toms River a water supply that more than fulfills their present needs.

Layne handled everything complete in one inclusive contract that saved city officials much time, useless expense and unnecessary worry. Layne offers this same type of service to any city or industrial plant in need of more well water.

NEW CATALOGS

Layne offers, without obligation, a wide range of catalogs and bulletins on well water systems, short coupled service pumps, oil and water lubricated pumps, irrigation wells and pumps, etc. You may obtain copies by addressing

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

Layne
WATER SUPPLY
WELLS & PUMPS

WANTED—Personnel Supervisor for southern pulp and paper mill. Over a thousand employees. Must have required academic background and experience in testing, hiring and general personnel and labor relations. Will, also, have supervision of insurance and safety. Excellent climatic location and opportunity. In replying state complete history and salary required. Address: Box 527, The Paper Industry.

FOR SALE—Complete yankee fourdrinier now operating at 670 feet. Dryer 8' diameter, 76½" face. Dryer hood and heater exhaust, reel, winder, collating and slitter equipment included. Wringer roll equipped. Suitable for making facial, wadding, toilet, towel and kraft specialties. Address: Box 528, The Paper Industry.

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VOTE

When women stumped for equal rights
They carried on, undaunted,
In spite of jeers and hostile sneers,
They got just what they wanted;
And ever since that fateful day,
The female sex has had its say.

Before the women got the vote
The Draper Felt was famous,
The superintendent missed the boat
In case he didn't name us.
So don't forget for better paper
To specify a Felt by Draper.

The DRAPER Felt

DRAPER BROTHERS COMPANY
Woolen Manufacturers Since 1856
CANTON, MASSACHUSETTS

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.80
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.		
Roofing—			
No. 1	1.80	to	1.90
No. 2	1.40	to	1.50
No. 3 and 4	1.30	to	1.40
Twos and Blues—			
Repacked	5.00	to	5.25
Thirds and Blues—			
Repacked	4.25	to	4.50
Miscellaneous	3.75	to	4.00
Whites, No. 1—			
Repacked	7.00	to	7.50
Miscellaneous	5.50	to	6.00
White, No. 2—			
Repacked	4.50	to	5.00
Miscellaneous	4.00	to	4.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings New Mixed Cuttings New Light Silesias Light Flannelettes Unbleached Cuttings New White Cuttings New Light Oxfords New Light Prints	Nominal

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens No. 2 White Linens No. 3 White Linens No. 4 White Linens No. 1 White Cottons No. 2 White Cottons No. 3 White Cottons No. 4 White Cottons Extra Light Prints Ord. Light Prints Med. Light Prints Dutch Blue Cottons French Blue Cottons French Blue Linens Checks and Blues Linsey Garments Dark Cottons Old Shopperies	Nominal

ROPE and BAGGING

f.o.b. and ex dock New York City

Gunny No. 1—	per cwt.		
Foreign	6.50	to	6.75
Domestic	6.50	to	6.75
Wool Tares—			
Light	8.50	to	9.00
Heavy	9.00	to	9.50
No. 1 Scrap Bagging	5.50	to	6.00
Manila Rope—			
No. 1 large	9.50	to	10.00
No. 1 small	9.00	to	9.50
Sisal Rope—			
No. 1 large	8.50	to	9.00
No. 1 small	8.00	to	8.50
New Burlap Cuttings	8.00	to	8.50
Jute Threads—			
Foreign (Nom.)	8.00	to	8.50
Domestic	8.00	to	8.50
Strings—			
No. 1 sisal	5.50	to	5.75
No. 2 sisal	5.00	to	5.25
Soft jute	5.25	to	5.50
Mixed	3.50	to	3.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	200.00—
Hard White, No. 1	160.00—
Soft White, No. 1	115.00—
Soft White, one-cut	130.00—
Soft White, Misc.	100.00—
Fly Leaf, No. 1	55.00—
Fly Leaf, Woody No. 1	45.00—
No. 2 Mixed Col. Woody	40.00—
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	40.00—
Mixed Books	26.00—
Ledger Stock—	
No. 1 White	105.00—
No. 1 Mixed (Colored)	80.00—
Manilas—	
New Env. Cuttings	120.00—
New Env. Cuts, One-Cut	—
Extra Manilas	75.00—
Manila Tab Cards, Free of Ground Wood	130.00—
Colored Tab Cards	90.00—
Kraft—	
New Envelope Cuttings	120.00—
Tripled Sorted No. 1 100%	65.00—
No. 1 Old Assorted	45.00—
News—	
White Blank	80.00—
Overissue	18.00—
No. 1 Folded	14.00—
Old Corrugated Containers	17.00—
New Jute Corrugated Cuts	24.00—
Mill Wrappers	14.00—
Box Board Chips	12.00—
No. 1 Mixed Paper	12.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—			
Lump, cwt.	4.55—		
Ground, cwt.	4.30—		
Powdered, cwt.	4.70—		
Blanc Fixe—			
Pulp, bulk, ton	90.00—		
Dry, barrels	95.00—		
Bleaching Powder—			
Drums, cwt.	5.00	to	6.00
Casein (Domestic Standard)			
20-30 mesh (bags), lb.			
80-100 mesh (bags), lb.	38.00	to	40.00
Argentine, lb.	35.50	to	36.00
China Clay—			
Domestic Filler Bulk (mine) ton	10.00	to	15.00
Domestic Coating Bulk (mine) ton	15.00	to	25.00
Imported (ship side) Bulk (lump) ton	22.00	to	30.00
Chlorine—			
Tank cars (wks) cwt.	2.80	to	3.05
Gelatine (silicin), lb.	1.25	to	1.35
Glyc. (C.P.) drums, lb.	.54½—		
Litharge, powd. bbl. lb.	.18¾	to	.20

Rosin (Gum)—	New York, per 100 lbs.
E	10.00—
F	10.00—
G	10.00—
WW	10.80—

Rosin (Wood), carlots, F.O.B. South	6.00	to	6.25

MARKET QUOTATIONS

Salt Cake—	
Dom. bulk (wks) ton	22.00 to 24.00
Imp. bulks on dock—(Atl. ports) ton (Nom.)	25.00—
Soda Ash—	
Bulk (works) cwt.	1.20—
Paper bags, cwt.	1.60—
Soda (Caustic)—	
Solid drums, cwt.	3.35 to 3.40
Ground and flake, drums, cwt.	3.75 to 3.85
Sodium Silicate—	
60 deg. 55 gal. drums, (works) cwt.	1.80 to 1.90
40 deg. 35 gal. drums, (works), cwt.	1.50 to 1.60
Starch—	
Pearl, 140 lb. bags, cwt.	6.09—
Pearl, barrels, cwt.	6.09—
Paper (Sp.) bags, cwt.	6.09—
Powdered, barrels, cwt.	6.32—
Sulphur (Crude)	
(Mine) bulk, long ton	22.00—
Talc—	
Dom. 100 lb. bags (mine) ton	35.00 to 38.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig. bbls., lb.	.21 to .21½
Calcium Pig. bbls., lb.	.21 to .21½
Zinc Sulphide, bbls., lb.	11.50 to 11.75

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite	140.00—
Unbleached sulphite	132.50—
Bleached sulphate	145.00—
Semi-bleached sulphate	140.00—
Unbleached sulphate	132.50
Bleached soda	140.00—
Ground wood	92.50—
Sulphite screenings	72.50—
Sulphate screenings	67.50—
Ground wood screenings	60.00—
Unbleached sulphate siderurgs	92.50—
Standard news print siderun	132.00—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, folow:

Bleached sulphite	225.00—
Bleached sulphate	230.00—
Unbleached sulphite	200.00—
Unbleached sulphate	200.00—

PAPER

f.o.b. New York City

	per ton
Boards—	
Binders	140.00—
Chip	105.00—
Chip, tube and can	115.00—
Chip, full blending	117.50—
Chip, sgl. mls. lined	130.00—
Coated, white patent	
.016	170.00 to 180.00
.020 and heavier	160.00 to 170.00
Kraft liner	115.00—
Filled News	107.50 to 110.00
Container	130.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	18.15—
B Grade E. F.	18.40—
A Grade S. C.	18.65—
B Grade S. C.	17.40—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White	
No. 1 Glossy	22.90—
No. 2 Glossy	22.15—
No. 3 Glossy	21.90—
No. 4 Glossy	—
No. 2 Offset	18.65—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with sense, quantity, packing and other differentials allowed:

	per cwt.
Rag Content Bond—	
(In Ton Lots)	
Extra 100% Rag	70.45—
100% Rag	62.45—
75% Rag	48.15—
50% Rag	38.90—
25% Rag	31.65—
Rag Content Ledger—	
(In Ton Lots)	
Extra 100% Rag	72.65—
100% Rag	63.90—
75% Rag	49.40—
50% Rag	40.20—
25% Rag	33.00—
Sulphite Bond—	
Air dry, watermarked	—
No. 1 watermarked	19.05—
No. 2 watermarked	18.10—
No. 4 watermarked	17.10—
Sulphite Ledger—	
No. 1 watermarked	21.15—
No. 2 watermarked	21.00—
No. 4 watermarked	20.40—
Glassine (f.o.b. mill)—	
OPS base ceilings (CPR 76):	
25 lb. base No. 1 bleached glassine	22.50—
25 lb. base No. 1 bleached greaseproof	20.00—
News—	per ton
Rolls, Standard (Contract)	114.00 to 116.00
Rolls (Spot)	(Nominal)
Sheets	130.00—
Tissues (Carlots)—	per ream
White No. 1	2.25—
White No. 2	1.75—
Bleached Anti-Tarnish	—
Colored	2.20—
Anti-Tarnish Kraft	2.10—
Manila	2.20—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	9.35—
Toilet, Unbleached (M shts.) per cs.	6.60—
Towels	per case
Bleached	6.65—
Unbleached	5.65—
Wrappings (Kraft)—	
OPS ceilings, per cwt., 50 lb. base weight:	per cwt.
Standard wrapping	7.75—
Butchers, counter rolls	8.25—
Standard bag, mill rolls	7.50—
Shipping sack, mill rolls	7.75—
Gumming, mill rolls	8.00—
Asphalting, mill rolls	7.75—
Envelope, mill rolls	9.25—
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)	
Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (carloads only) (10,000 lb.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers	
Com. Gr. Butch. 40 lb.	
No. 1 Butchers	—
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—
Manilas—	
Envp. Mls., Sub. 16-40 (No. 1)	—
Env. Mls., Sub. 16-28 (No. 2)	—
Envp. Mls. (Prices based on large sheets untrimmed ream marked, in bdls.)	—
Wrapp. Mls. 35 lb. up—	
No. 1	8.75 to 10.25
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B-20 lb.	—
Grade A-22 lb.	—

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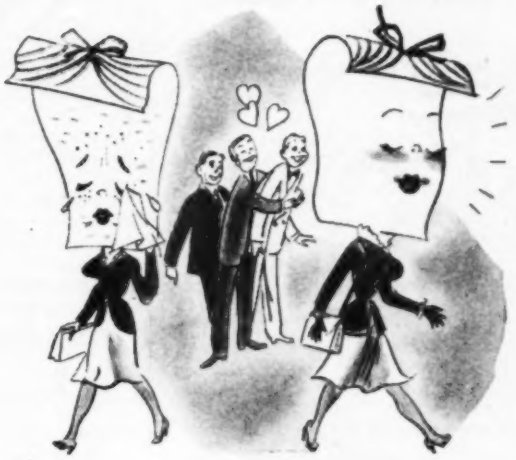

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Permutit Equipment Gives You Complete Control of Water Quality

Why put up with bad water? Whatever your local water conditions, Permutit equipment can bring you soft, chemically correct process water at all times. Good water helps your paper keep its good looks, your production run smoothly, and your profit curves prosper!

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PERMUTIT

POSTERS
—A POTENT SAFETY TOOL

Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition* and *continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in three sizes: "A" size, 8½" x 11½"; "B" size, 17x23"; and "C" size, 25x38". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the 1951 Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL

425 N. Michigan Ave.

Chicago 11, Illinois

The Paper Industry Index to Advertisers

When writing them, please mention The PAPER INDUSTRY.

Refer to the Paper and Pulp Mill Catalogue and Engineering Handbook at your mill office, for complete listing of all advertisers' products.

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American Car & Foundry Co. 861
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Appleton Wire Works, Inc. 856
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Arnold, Hoffman & Co., Inc. 970
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Atkins and Company, E. C. 965
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Bagley & Sewell Co., The 940
Bailey Meter Company 860
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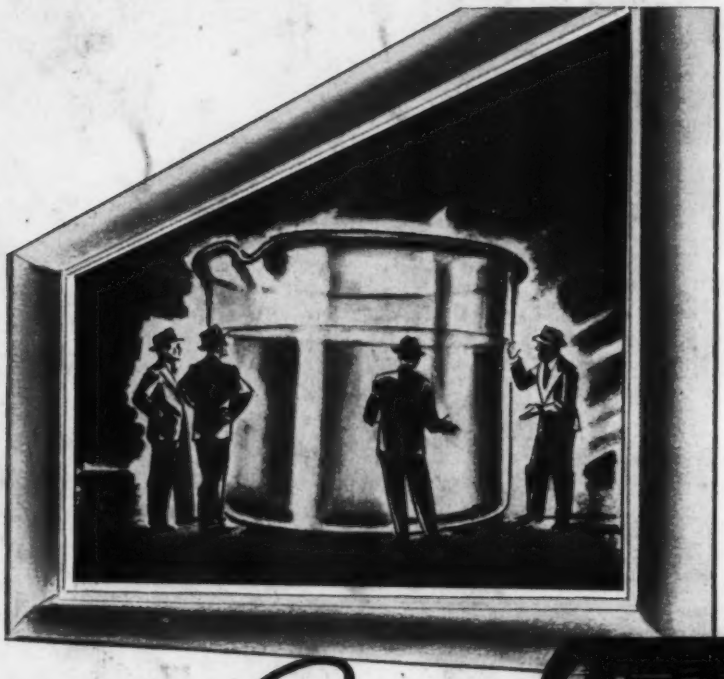

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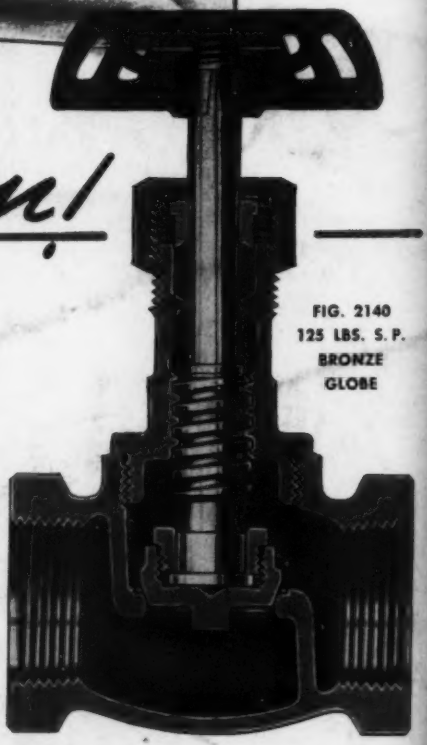

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